The NEW ZEALAND JOURNAL OF AGRICULTURE

Vol. 63 WELLINGTON, DECEMBER 15, 1941. No. 6

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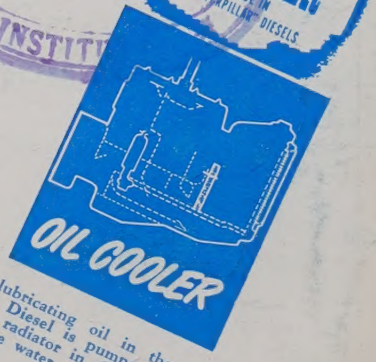

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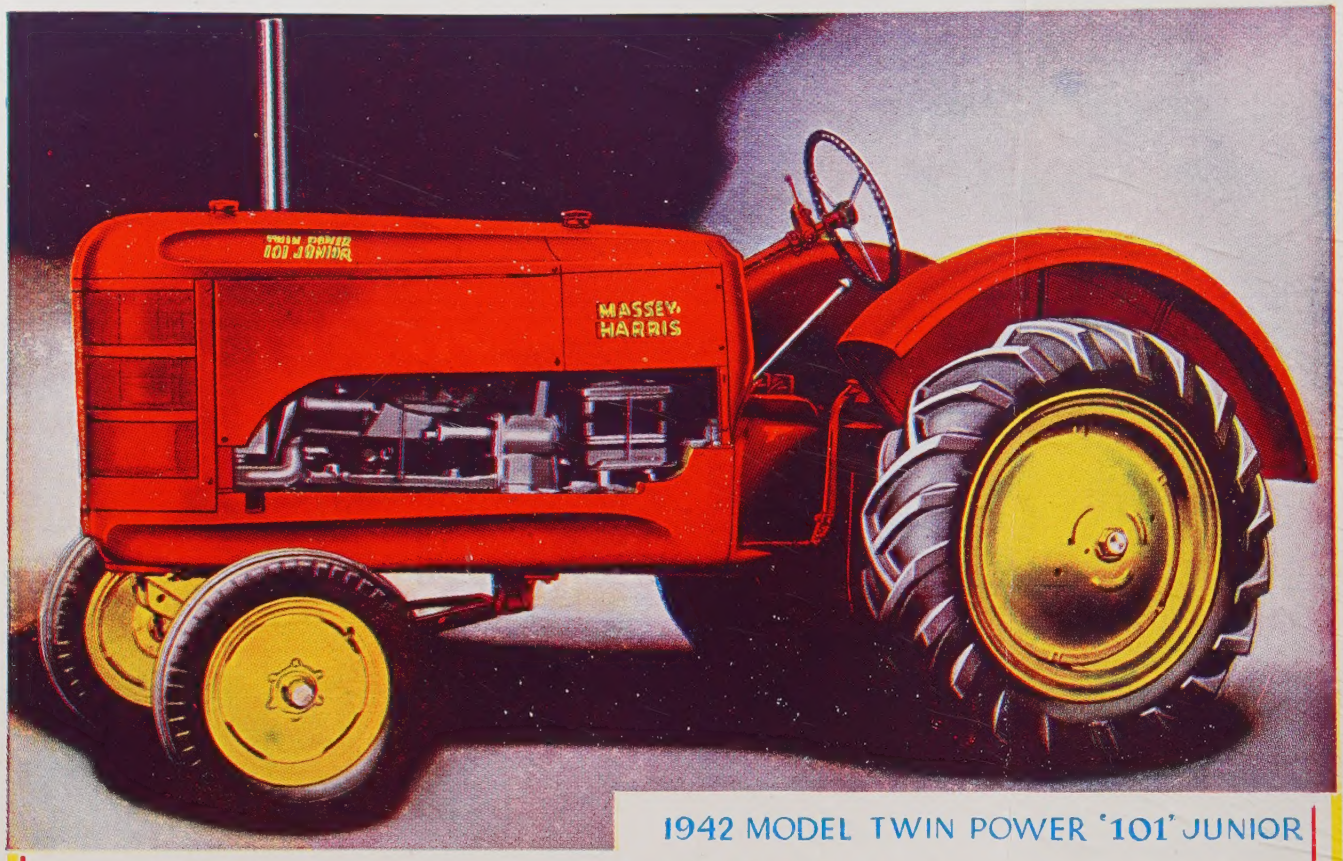

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THE NEW ZEALAND
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Rearing Strong Healthy Calves

Rotational Grazing Will Help To Build Up Animal's Resistance To Parasitic Infection

By
C. E. BALLINGER,
Research Officer, Ruakura Animal Research Station.

REARING strong, healthy calves is to some farmers a difficult problem, and in some instances the mortality in calves between weaning and the following spring may reach 30 to 40 per cent. in spite of the fact that a good deal of drenching for worms is carried out.

Many farmers complain that they can rear calves without any trouble until weaning time, but that soon after the calves are weaned they begin going back in condition and a number of them eventually die.

The farm conditions under which a good deal of trouble occurs are usually somewhat as follows:—The calves are retained in the calf paddock or a convenient cow paddock until they are weaned, and are then placed in a paddock not wanted by the dairy herd. The paddock becomes overgrown to some extent, as the calves are not able to keep the growth completely under control. The paddock then becomes a series of closely-grazed patches surrounded by rough overgrown areas of pasture.

These conditions exist until the late autumn, when it becomes evident that the calves are not "doing" as well as they should—a number of them begin to look unthrifty, their coats become dry and harsh, they look dull in the eye. Scouring will now be evident, but this is often attributed to the autumn flush of grass. The calves now begin to lose condition rapidly, and soon arrive at the stage where they refuse to eat anything they are offered, their only desire being to stand and sip water. After this the end is fairly rapid.

Preventive Nutrition

Parasitic worms are usually considered to be the cause of the trouble, and drenching to control these worms is frequently carried out, but often without great success. A new helminthic—phenothiazine—is now on the market, and good results have been claimed fo this preparation, but while parasitic worms are important, nutrition and management are at least equally important.

The critical period of the calf's life is between weaning and the following spring, but preventive nutrition that will build up the calves' vigour to resist infection should start when the calves are about three months old. Investigation into the problem of calf rearing is proceeding at Ruakura Animal Research Station, and the results obtained last year are of interest and value to those who experience trouble in rearing calves.

The aim of the investigation was to see what benefit calves derived by giving them the best pasture on the dairy farm as compared with the ordinary method of set stocking calves in one or two paddocks. The best pasture was given by rotating the calves through the paddocks a few days ahead of the dairy cows. In this way they had access to the pasture in its most palatable form and when its feed value was highest.

Evidence of Weight

Twenty-nine calves were divided into two groups for the investigation, all of which received the same ration of skim-milk and concentrates up to

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weaning. The only difference throughout the trial was the method of grazing. The rotational grazing began on November 21, and the mean weight of both groups was then as follows:—

	Weight.
Set stocked group	207.6 lb.
Rotationally grazed group ..	210.8 lb.

By the end of January—that is, after ten weeks' grazing—the rotational grazing group averaged about 27 lb. heavier than the set stocked group, and by the end of February the difference had increased to nearly 37 lb. By this time the difference in general condition and vigour between the groups was becoming obvious, and became markedly so as the autumn advanced.

By April 17 the mean liveweight for each group was as follows:—

	Weight.
Set stocked group	350.7 lb.
Rotationally grazed	439.4 lb.
Difference	88.7 lb.

By means of good grazing the rotational group were 88.7 lb. heavier than the set stocked group, and were, of course, in a strong, healthy condition to go through the winter.

By this time many of the calves of the set stocked group were showing typical signs of worm infestation, and were rapidly losing condition. Nine of the fourteen had to be placed on special treatment for many weeks, but in spite of every attention four of the calves died. On the other hand, only two calves in the rotational group showed any signs of unthriftiness throughout the winter, and both responded to special treatment in two or three weeks.

Conclusion

The method of rotational grazing would appear, therefore, to have a good deal to recommend it, in that it is a preventive method which gives the young animal the best of food to build up its vigour to withstand the effects of parasitic infestation. In all our stock troubles prevention rather than cure should be the objective, and preventative treatment for the troubles experienced with calves in the coming autumn and winter should begin now. A little extra trouble is incurred in driving the calves around the paddocks, but if they are handled quietly they are driven as easily as the milking herd.

The pasture production figures quoted are taken from first-year yields of a long-term investigation, but they provide interesting and instructive data which show the deficiencies in the winter feed supply in the district discussed. The information presented will be applicable to a number of dairying districts under similar climatic conditions, and at this time farmers may consider the advisability of increasing hay and ensilage supplies.

By

G. A. BLAKE,
Instructor in Agriculture,
Stratford.

DURING last season a long-term investigation was started on the Stratford Demonstration Farm to determine the amount of actual feed produced from pastures per acre per day. Although the season under review was better than the average, some interesting facts have been revealed, and while the deductions arrived at apply to Central Taranaki, they can, in the main, be applied elsewhere to the benefit of both the farmer and his stock.

To ascertain the daily growth on the field, four wire-netting enclosures 11ft. square were placed at intervals, and these were used in pairs, being alternatively trimmed with a lawn mower to an even height, and then again cut to the same height after sufficient growth had resulted. Samples of this second cut were analysed for dry matter content, and also for the proportion of species of grasses, clovers, and weeds present. To prevent the sward changes that will take place with continual cutting, the enclosures were moved to a fresh site after each second mowing.

The first annual summary shows that 5273lb. of dry matter per acre were produced, but as an average dairy cow producing 1lb. of butterfat per day without loss of weight requires 7300lb. per year, the first deduction arrived at is that in this district 1.4 acres will produce enough grass to feed one dairy cow adequately, provided, however, that proper utilisation and management are employed.

Amounts of Feed Produced

The accompanying table shows the monthly amounts of actual feed produced, together with a dairy cow's requirements during the same period:—

Some of the surplus grass should be converted into silage.

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Period.	Month.	Lb. of Dry Matter per acre.	Lb. of Dry Matter on 1.4 acres.	Lb. of Dry Matter required by 1 cow.
Winter ..	June ..	176	246	394
	July ..	46	64	467
	August ..	343	480	752
		565	790	1,613
Spring ..	September	697	976	810
	October	544	762	767
	November	754	1,055	723
		1,995	2,793	2,300
Summer	December	741	1,037	679
	January	507	710	628
	February	603	844	613
		1,851	2,591	1,920
Autumn	March ..	444	622	584
	April ..	243	340	555
	May ..	175	245	358
		862	1,207	1,497

A study of this table shows that from September to March, inclusive, the feed produced is approximately 60 per cent. in excess of the requirements of the cow, while for the balance of the year the feed produced falls far short of this, and it is the evening up of these periods of over and short supply that calls for better farm management, involving better utilisation of the productive power of the land.

In this district fields of hay and ensilage are closed about October, harvesting operations usually being completed by the end of December or early in January. It then follows that the growth during January, February, and March, which is above the normal requirements, is not fully utilised during its growing period, and is allowed to stand until eaten during April and May, when the production is less than half the requirements of the stock.

JUNE, JULY AND AUGUST ARE THEREFORE THE CRITICAL MONTHS.

If all the surplus grass grown during October, November, and December were saved as hay and ensilage, 685lb. of dry matter per cow would be available for winter use, but during the winter months there is produced another 790lb. dry matter per cow, which, with the surplus of 166lb. in September, gives a total of 1641lb. of food per cow for this period. During June, July, and August the cow requires 1613lb. dry matter, thus leaving enough to provide sufficient hay during September to prevent any undue scouring.

On again referring to the table, it is found that 731lb., including the surplus in September, are produced during the winter, but as 1641lb. have to be provided for winter use, a sufficient area to produce the balance of 910lb. must be closed. As one acre during October, November, and December produces 2039lb. the area harvested per cow should be 910/2039 acres, or ½ acre approximately. An analysis of the statistics for 1939-40 reveals that .3 acres is the average area per cow cut for hay and ensilage in New Zealand.

Greater Area Needed

Figures secured to date have shown that the area at present saved for hay and ensilage is insufficient for stock requirements, and provision to harvest a greater acreage should be made, especially during the coming season, when the shortage of phosphatic fertilisers will probably result in reduced yields per acre, and a slower recovery in the spring.

Where young stock as well as the milkers have to be wintered, it has been calculated from the figures secured to date, that for every ten head of young stock wintered an extra 1½ acres should be harvested as hay or ensilage.

On many farms where the contour of the country prevents a sufficient area being harvested as hay and ensilage, swedes are grown on which to winter stock, and where this is so, one acre for every ten head should be provided, the small amount of hay available being used during September, as previously mentioned.

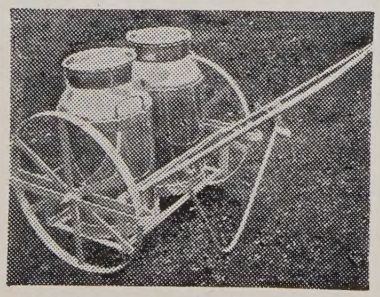
Under heavy or special topdressing the production of the farm would be greatly increased, but the figures used in this article were obtained after topdressing of 2½cwt of superphosphate and 2½cwt. of lime, which is approximately the topdressing programme of the district.

Analysis of the sward shows that it consists of ryegrass, white clover, cocksfoot, crested dogstail, sweet vernal, Yorkshire fog, and some flat weeds, and is comparable with the swards on surrounding farms.

While it is admitted that this investigation has been in progress for only one year, and will need to be continued for several years to obtain an average, the outstanding fact revealed is that half an acre per cow plus 1½ acres for every ten head of young stock should be saved as hay and ensilage to provide adequately for the winter and also to utilise fully the feed produced.

SOFT GROUND NOT DAMAGED

BY HANDY TRUCK



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THAT humus is the fundamental basis of the fertility of our farms and gardens is widely accepted. Why is it, then, that every day one sees evidence of deliberate wastage of this valuable fertiliser?

Farmyard manure, perhaps more than any form of humus, is used to decorate cowsheds, yards, or is carried off in drains. Stack bottoms and

By
A. M. LEE,
Fields Instructor,
Whangarei.

rotted hay are frequently burnt, as this is the easiest and surest way of "getting rid" of a lot of rubbish, and a great quantity of other kinds of rubbish are consigned to the convenient but all too consuming fire. The point is that most rubbish from man's point of view is not rubbish from Nature's point of view. Surely we are gradually depleting our fertility by failing to return to the soil all waste vegetation for which we have no use.

Increased Fertility

Composting as a means of maintaining and increasing fertility is practised on a few farms, notably in England, and there is no doubt that there is ample opportunity for the universal adoption of this method of utilising our vegetable waste. Nothing should be wasted—weeds, vegetable trimmings, leaves, tree prunings, farmyard manure, and wood ashes may all be sandwiched into the compost heap with layers of earth and lime.

There are very few waste organic materials which should not be included in the making of compost. These include coal ashes, paper, woody stems and cuttings, sawdust, material tainted with oil, creosote, tar, or any poisonous or preservative chemical. Ashes from a bonfire should be dug in or incorporated in the compost as soon as they are cold and not left for the rain to wash away the very soluble form of potash contained in them.

Events such as the present war and fertiliser rationing should not be necessary to draw our attention to the desirability of using all available vegetable materials for composting and subsequent incorporation in the soil. There are many gardeners who will support the writer in his contention that nothing serves the gardener better than good, well-rotted compost. Why not the farmer, too? Articles have frequently appeared in the "Journal" on the use of farmyard and liquid manure, and this article should be regarded as a further plea for the retention and use of all waste organic matter for fertilising purposes.

A scientific writer has said: "Compost adds life to the soil, for it brings its own bacteria and is immediately ready to start feeding the crop. Its humus-contents give rootlets easy access to the fertility." Lack of humus and the application of artificial fertilisers may even be a factor in the occurrence of plant diseases, of which no small number are now present in this country. Soil erosion, too, is one of the most serious consequences following the destruction of humus.

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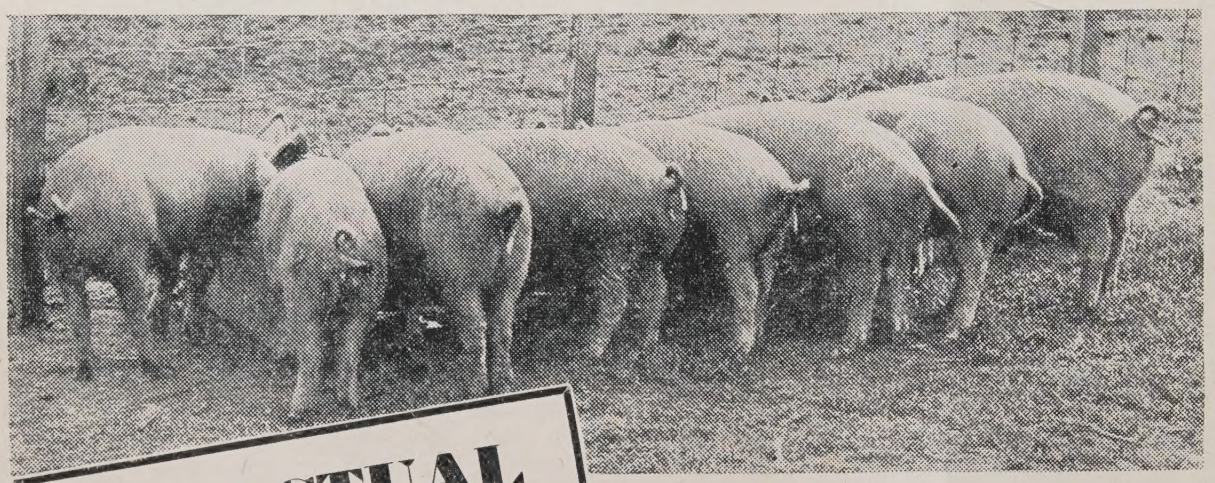

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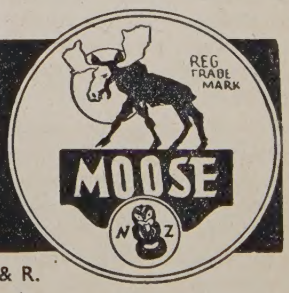

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Composting

The process known as composting is based on the fact that if vegetable matter, soil, water, and air are brought together and provided with a "starter," a fermentation or digestion takes place. Lime is necessary to neutralise the acids which are formed. This action converts the material to humus, a substance essential for maintaining the fertility of all soils.

Material Used

Leaves, grass cuttings, sods, lawn-mowings, pea, bean, or potato tops, outer leaves or tops of vegetables, hedge clippings, weeds, faded flowers, potato peelings and kitchen refuse—in short. any plant refuse, green or otherwise, may be used for manurial purposes. Autumn leaves, because of their dryness, tend to decompose slowly, and should be mixed with sappy material or even dealt with in a separate heap. Decomposition of very fibrous matter, such as cabbage stumps and potato haulms, will be hastened if it is chopped into short lengths and broken up.

If the composting is properly done perennial roots, such as couch grass and the seeds of annual weeds will be destroyed by the combination of heat, moisture, and active fermentation.

Value of Compost

The amount of nitrogen in well-made compost may be equal to that in farmyard manure, and the potash and phosphate content may be even higher. It is a valuable manure for all crops, and should be buried not more than 3 to 4 inches deep. If lightly hoed in, it is an excellent mulch or top-dressing.

How to Make a Compost Heap.

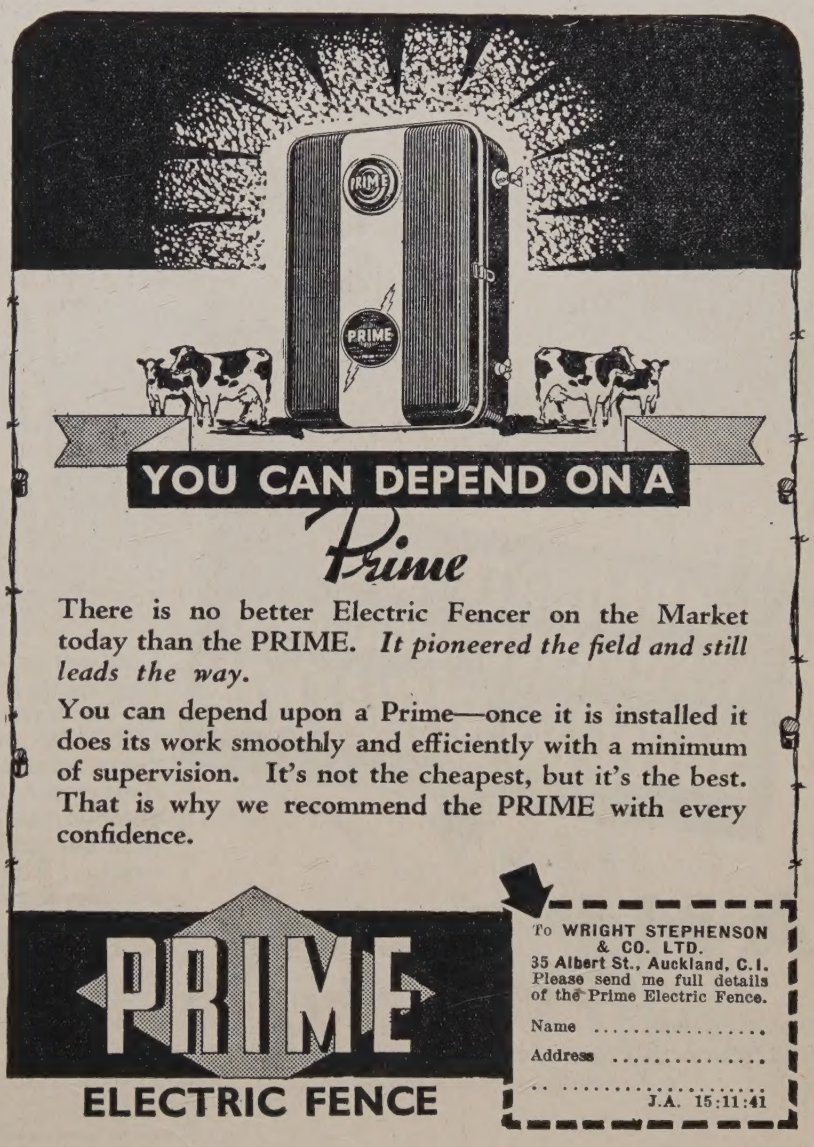
A useful compost heap may be made 4 to 7 feet wide, 3 to 5 feet high, and of any convenient length according to the amount of material likely to be available. The turf and soil are removed from the site (preferably a spot shaded from the full heat of the sun) to a depth of 1 foot and retained on one side. Layers of materials are then put in as follows:—

First layer of vegetable refuse (the more mixed the better), about 4 to 6 inches thick. Should it be dry and stemmy, moisten it slightly and tramp it well (the more broken the better). If green and sappy, lay it loosely.

Second layer of animal manure, which is the best of all, half to one inch thick; if animal manure is not obtainable, use a sprinkling of one of the proprietary chemicals sold for this purpose by most horticultural dealers. If animal manure has been used, a sprinkling of lime should be given after each 4 to 6 inch layer of refuse, but it is best not to apply the lime directly on the animal manure, and a layer of refuse or soil should be left between them. If one of the proprietary compost makers is used, this will probably contain sufficient lime. Wood ashes or bonfire ashes may be used in place of lime, and any kind of liquid manure may take the place of animal manure.

Third layer is of soil, ½ to 1 inch thick. In summer, or with dry materials, more should be used; in winter, or with sappy stuff, less is necessary. If the soil is loose in texture it should be more generously applied than soil of a stiff or sticky nature. If available, a little old compost from an earlier heap should be mixed with the soil.

These layers should be repeated until the required height is reached, and the whole heap is then covered with a coating of soil 1 to 2 inches thick. In many gardens sufficient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material will probably not be available to build the heap in one operation, in which case it may be built gradually, but after about two weeks in summer or six in winter it should be finished off.

Turning the Heap

In a few days, according to the material and weather conditions, heat will be generated, or at least the heap will become warm. If it does not, no harm is done, but it will be longer before the material is ready for use. A heap which has become very hot may be turned over after three to six weeks when it has begun to cool down. Cooler heaps should be left six to twelve weeks before turning. Turning should begin from one end, mixing the layers, and the original outside of the heap should be thrown inside. After a further period, which may vary from three weeks to six months, the whole heap should be uniformly dark in colour, earthy in texture, and all the material completely rotted. It is then ready for use.

Burning Rubbish

Fires on the farm or in the garden should be restricted to the smallest limits and confined to woody material, sticks, thick roots, and diseased material. All other vegetation should find its way back to the soil.

Radio Broadcasts

THE following programme of radio broadcasts for farmers will be given under the auspices of the National Pig Industry Council during January:—

2YA, January 13, 7.30 p.m.—Answers to correspondence on pig production: Mr. C. H. M. Sorenson, Taranaki District Pig Council.

1YA, January 15, 7.15 p.m.—Value of and improvement of carcass quality: Mr. C. P. Harington, Waikato District Pig Council.

3YA, January 15, 7.15 p.m.—Subject not decided: Mr. H. W. McIntosh, Canterbury District Pig Council.

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Weeds

By S. H. SAXBY,
Instructor in Agriculture,
Dunedin.

Much Farm Land Has Deteriorated Through Lack Of Control

THE term "weed" has many definitions, which quite naturally vary with the outlook of the persons responsible for their definitions. One fact that all definitions imply, even if they do not express it, is that, to a farmer, a plant is a weed only when its presence interferes with farm production to such an extent that production is lowered. In other words, a plant becomes a weed only when its presence results in financial loss.

This definition is necessarily very broad, because, until one knows the circumstances in which a plant is growing, it is impossible to say whether it is a useful plant or a weed. For example, gorse in a well-trimmed hedge may nearly always be regarded as a useful plant. On the other hand, where it has virtually taken charge of much of our second class hill country, gorse is undoubtedly a very bad weed. Similarly, some of the thistles are useful plants when growing on poor country, but are weeds on first-class country.

Four Major Groups

Weeds may be divided into four major groups, these groups indicating the manner in which the various weed plants are responsible for loss in farm production.

The first and most important is that large group of plants which are weeds because they compete with, and tend to dominate, more desirable plants. Into this group fall most weeds of arable crops and pastures. The competition exerted by these weeds varies considerably according to the type of crop, the climate, the nature of the soil, and the kind of weed. On the whole, however, perennial weeds are more serious in perennial crops, the most important of which is pasture. Such perennial weeds are rushes, manuka, blackberry, and fern. Similarly, annual weeds are most harmful in annual crops and young pastures. Plants of this type are fat hen, spurry, and fumitory.

There is, however, a group of perennial weeds which is equally harmful in both annual and perennial crops. This is the group known as "twitch" or "couch." Although these terms usually refer to some half a dozen or so rhizomatous grasses, they could well be enlarged to include all those plants which have creeping underground or overground roots or stems, portions of which readily form new plants when broken off from the parent plant. Such plants are Californian thistle, sheep's sorrel, yarrow, creeping fog, and onion twitch.

The second group of weed plants are parasites—that is, they derive their nourishment entirely from other plants and not from the soil and air, as do most plants. Fortunately, only two such plants are at all common in New Zealand. These are dodder and broom rape. Of these, broom rape is the more common, but appears to do comparatively little harm. On the other hand, considerable damage is periodically done by dodder.

The third group of weeds consists of plants of which various parts cause direct damage and reduction in value to livestock products. The best known example of this group is bidi bidi, which, apart from taking up valuable ground in the pasture, is responsible for lower wool values. Several other "burr" plants have a similar effect. In addition, the seeds of some plants, notably spear grass and barley grass,

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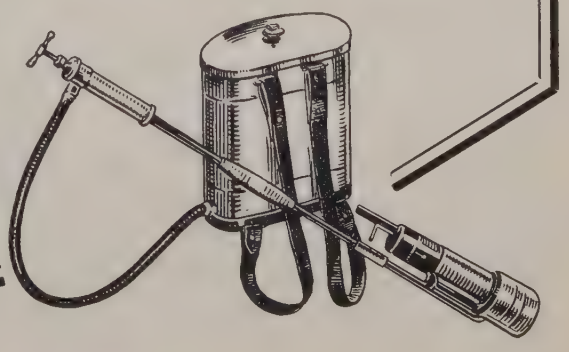

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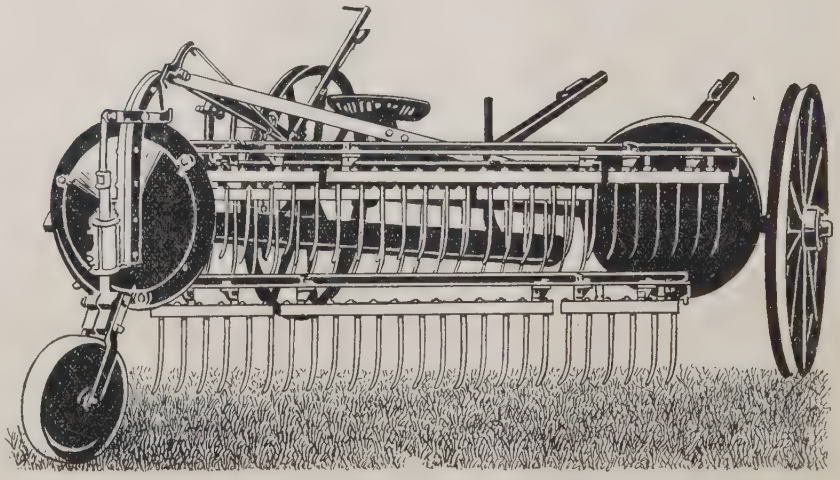

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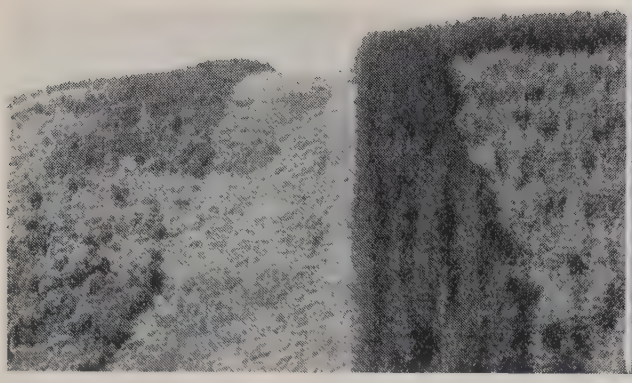


On much second-class country gorse has made tremendous strides. Its elimination and sowing down to pasture is often not profitable, with the result that public bodies have in some areas taken over the land and turned it into profit with large tree planting schemes.

[*H. Drake, photo.*

As soon as farming in this country began, certain native plants began to interfere with man's farming and hence became weeds. Here, manuka on the left and bracken fern on the right in the background are typical examples.

[*H. Drake, photo.*

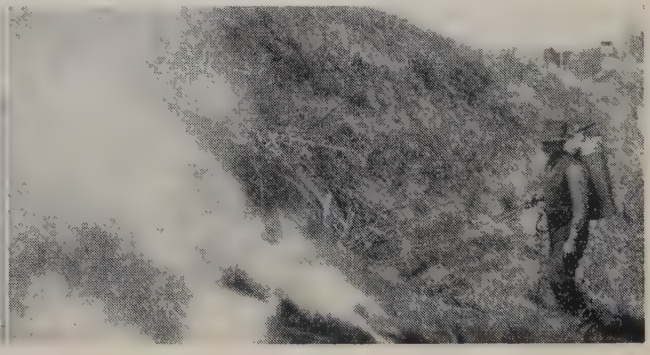
actually penetrate the skin of sheep, reducing the value of both the skin and the carcass.

Yet another type of plant which reduces the value of livestock is that which taints milk. Many plants are blamed from time to time as being responsible for tainted milk, varying from turnips to white clover. Frequently, when tainted milk is produced a search is made and the most conspicuous and likely looking plant is blamed, often quite wrongly. There are, however, a number of plants which will unquestionably produce tainted milk. The most glaring example is wild garlic.

The fourth group of weed plants is that which embraces those poisonous to livestock. Exact information on this subject is hard to obtain, and a large number of cases of reported poisoning are a matter of opinion rather than of certainty. Many plants which are known to contain certain poisonous substances are often of common occurrence in pastures, and yet stock thrive on those pastures. In farm animals certain species, and individuals within a species, show marked differences in susceptibility to plant poisons—that is, the toxic dose of certain poisons varies considerably from animal to animal. In addition, the chances of animals obtaining a toxic dose of plant poisons also vary.

In pastures weeds rapidly gain entry when the sward is damaged by various means. Here, thistles may be seen occupying the portion of a paddock where the sown grasses were drowned out during the winter.

[*S. H. Saxby, photo.*



The destruction of large weeds on grazing country, whether by burning or spraying, leaves many open spaces, and should be followed by the sowing of suitable grass and clover seed. If this is not carried out, innumerable seedlings will rapidly establish and result in more dense cover of weeds than before.

[*S. H. Saxby, photo.*

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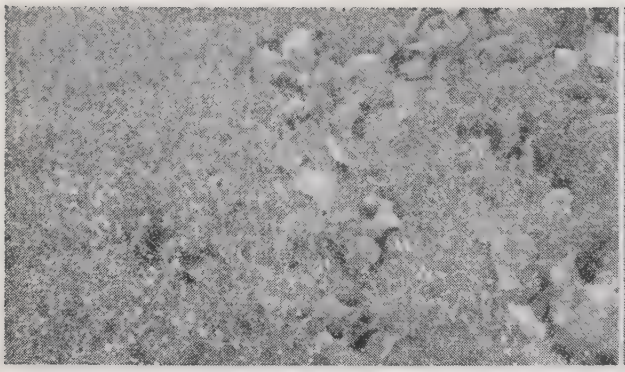

As a rule, annual weeds compete most seriously with annual crops. Here, spurrey is competing strongly with a crop of soft turnips.

Several of our worst weeds are plants which were introduced from a utility or sentimental viewpoint, and have subsequently escaped. Brier (illustrated), gorse and blackberry are of this type.

[*H. Drake, photo.*

Poisonous Properties

On the whole, therefore, the poisonous properties of many plants vary with both the animals concerned and the conditions under which the plants are eaten. For example, sheep's sorrel is not infrequently referred to as being poisonous to sheep, yet there are districts where sheep depend to a large extent on sheep's sorrel for their fodder, and do well on it. Similarly, the native tutu plant has a bad reputation as a poisonous plant, yet many run cattle have access to it all their lives. Whether they are poisoned or not depends largely on both the condition that they are in and on the extent to which they are forced to feed on it through lack of other feed.

Another example is that of ragwort, the poisonous effect of which is cumulative. For this reason it is most harmful to animals, the life of which farm practice decrees shall be long. Hence, horses and cattle have greater opportunities of becoming affected than sheep or pigs. Sheep are certainly sometimes seriously affected, but this may be obviated by judicious management.

In some publications dealing with plant poisons long lists of plants which are reputed to be poisonous are given, but if they were always as poisonous as stated, there is no doubt that the mortality of stock through plant poisons would be infinitely higher than it is.

Some of our worst weeds are plants which were deliberately introduced into the country from a utility or sentimental point of view. Plants such as blackberry, sweet briar, and gorse are introduced plants that have "escaped." If it had been possible to keep these plants either out of the country or at least within their desired confines they would not have presented the major problem that they do now. On the other hand, the greatest number of unwanted plants were introduced accidentally in the early days of colonisation. Many came as impurities in agricultural seeds, some came in the wool of imported sheep, and yet others arrived in packing and ships' ballast.

In addition to the imported weeds, there is a considerable number of native plants which, as soon as farming in this country began, immediately became weeds. Of these, the most striking examples are bracken fern and bidi bidi. Further, there are innumerable other native plants which

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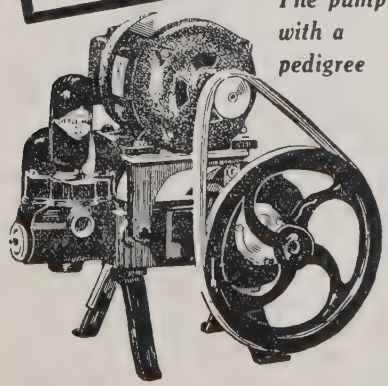

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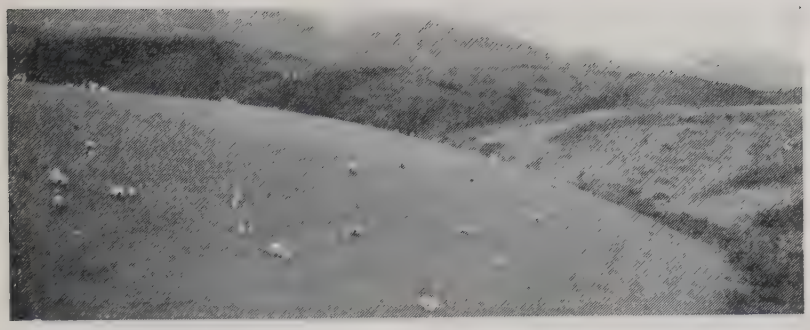

On marginal land there is a constant fight against "weed plants." Here, with the use of suitable species and strains of grasses and clovers, together with lime and phosphate, the "weeds" are kept in check and the pasture rendered productive.

[S. H. Saxby, photo.

constitute the secondary growth problem in bush areas throughout the country.

Means of Dispersal

In considering the subject of weeds the question of means of dispersal is of some moment. Once introduced into a country, many plants will, if allowed, spread rapidly by a number of means. During the last hundred years or so some 400 species of plants have been introduced and have become fully naturalised in one or more parts of the country where conditions are suitable to them. Of the various ways in which seeds of weeds have been dispersed within the country, that of impurities in agricultural seeds is probably the most common. Although the dressing of agricultural seeds has now reached a high standard, this has not always been the case, and the trading from one part of New Zealand to another of weed-infested seed doubtless spread the weed population far and wide. Even at the present time, the distribution of cheap pasture seed mixtures means the distribution of many weeds.

Wind plays an important part in seed distribution, especially with plants of the thistle family, whose seeds may be carried many miles in this manner. Animals, particularly sheep, collect a large number of seeds in their wool and hair. When the animals are transported the seed goes with them, to fall to the ground, perhaps many miles away, and to start a new colony of weeds. There is little doubt that much St. John's wort has spread in this manner. Birds also play an important part in weed distribution, of which the most notable example is that of the blackberry. Agricultural implements, such as threshing mills and other harvesting machinery, also spread weed seeds when travelling around the country.

Cost of Weed Control

The whole question of weed control is centred around cost. Everyone recognises that weeds are harmful, and everyone appreciates the fact that the cost of eliminating or controlling a particular weed cannot be more than the value of the increased production effected. For example, it is not profitable to clear gorse, manuka, or secondary growth if the cost of it is greater than the return that will be obtained from the extra stock carried. This is a salient feature of the farming of "marginal land," where cost of clearing and the return from it are almost

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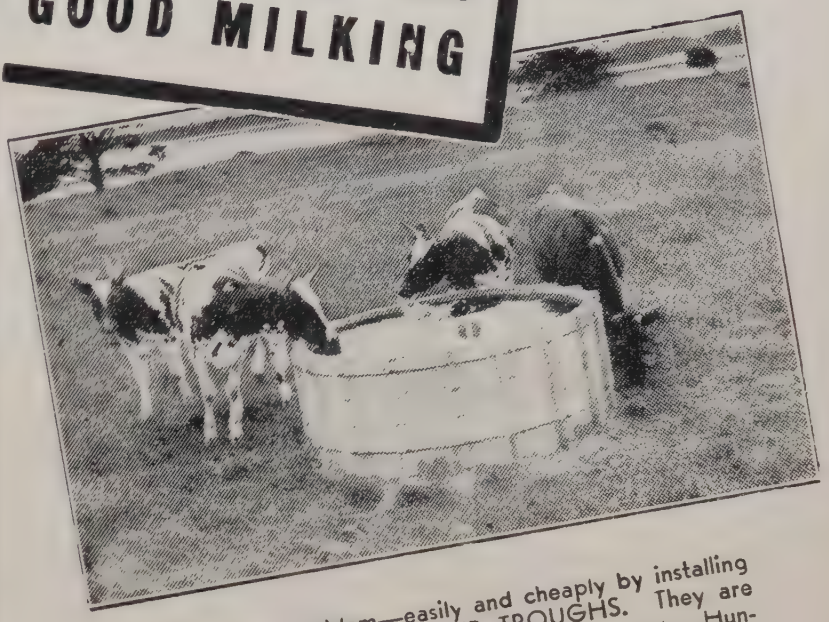

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On low-lying country drainage plays an important part in the elimination and control of weeds, such as nigger-head and rushes. Here is shown the outlet drain of a large drainage scheme in Otago.

[S. H. Saxby, photo.

balanced. If the cost of permanent clearing can be substantially reduced, or if the value of returns are increased, the operation at once becomes profitable.

Similarly, it is well recognised that careful cleaning of mangel, carrot, and turnip crops is profitable because the cost of cleaning is more than balanced by the extra yield obtained.

Method of Control

Annual weeds may be controlled in several ways. Firstly, there are many weeds, such as spurrey, fat hen, and wireweed, which germinate best in the spring, and consequently affect crops sown at this time. If possible, paddocks known to be infested with weeds of this type should be sown in the autumn rather than in the spring. If, however, it is essential to sow in the spring, as is often the case, a considerable measure of control may be effected by completing the main cultivation operations in ample time before sowing. Rolling and harrowing several times before sowing will do much to germinate and destroy a large percentage of weed seeds in the top soil.

Care should be taken to ensure that cultivation at this stage is not deep. Grubbing, for example, will only bring innumerable seeds to the surface, and the previous work will be undone. Once established in root crops, weeds may be controlled only by repeated hoeings when the weed plants are small. This operation should, of course, be carried out on a hot dry day, if possible, in order to obtain a good kill. In young pastures, annual weeds such as spurrey or fat hen may be kept within bounds by the use of the mower or with sheep.

Many means are adopted to control perennial weeds in pastures, each method depending on the type of weed, the extent of infestation and the value of the land. In some cases, grubbing by hand is an economic proposi-

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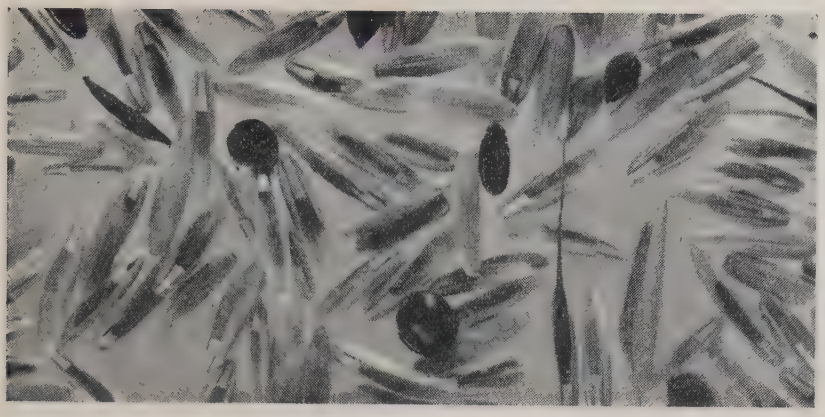

Most of our agricultural weed seeds were introduced, and are still being spread, through the buying and selling of "dirty" seed.

[H. Drake, photo.

tion, in others it is necessary to burn, plough, or employ heavy machinery.

Weed Killers

During the last few years much has been accomplished in the use of chemical weed killers. Of these chemicals, sodium chlorate and arsenic pentoxide have given the best results. The use of these chemicals will be referred to when specific weeds are being discussed.

The question of the control of weeds by insects has received a considerable amount of attention during the last few years. In some cases, such as with prickly pear in Australia, this method of control has given spectacular results. This, however, is exceptional, and undue optimism with regard to weed control by insects in New Zealand is not warranted. Complete control is unlikely, and any control that is effected must be regarded as supplementary to existing means. Insects have been introduced for the control of weeds such as gorse, bidi-bidi, and ragwort, and while some success has already been obtained, it is too early to be dogmatic regarding the ultimate effect of any of them.

In the control of some weeds, such as blackberry and ragwort, animals play quite an important part.

In addition to the foregoing, there are several other aspects which play an important part in weed control. Of these, drainage, lime, and fertilisers are all of considerable importance. Many weeds, such as rushes and buttercups, may be at least partly eliminated by efficient drainage, which also has the effect of strengthening the desirable plants.

Liming and manuring also tend to banish weeds such as sorrel and spurrey, not because lime and manure kill them, but because the soil conditions are so improved that useful plants will thrive and ultimately crowd out the weeds.

Suitable Species

The question of the use of suitable species is also closely connected with that of weed control in pastures. On heavy land, for example, the inclusion of foxtail and timothy in mixtures will do much to arrest such weeds as docks and thistles. On the other hand, the use of browntop and *lotus major* on bush burns will at least assist in the control of secondary growth.

The various strains of pasture plants play quite an important part in weed control. Some strains are not aggressive and die out rapidly, allowing weeds to gain entry into the sward. Other strains are aggressive and persistent, thus checking the ingress of weeds.

The necessity for sowing seed of a high standard of purity cannot be over-emphasised. It is not only a matter of securing seed with a low percentage of impurities, but also of knowing what these impurities are. For example, 1 per cent. of suckling clover in a sample of white clover will do little harm, but a much smaller percentage of dodder in the same sample may cause considerable damage.

One important aspect of weed control which is not given the consideration it warrants is that of the eradication of weeds new to a district. Generally speaking, a farmer should look with suspicion on any unfamiliar plant he finds on his property. He should have it identified, and if the plant has proved to be a menace elsewhere, every effort should be made to eradicate it at once. It is surely easier to destroy a weed occupying a square yard of ground this year than to wait and eradicate it when it has covered an acre or more in several years' time.

Names of Weeds

All plants have what is known as a botanical (or Latin) name, by which it is known by botanists in every

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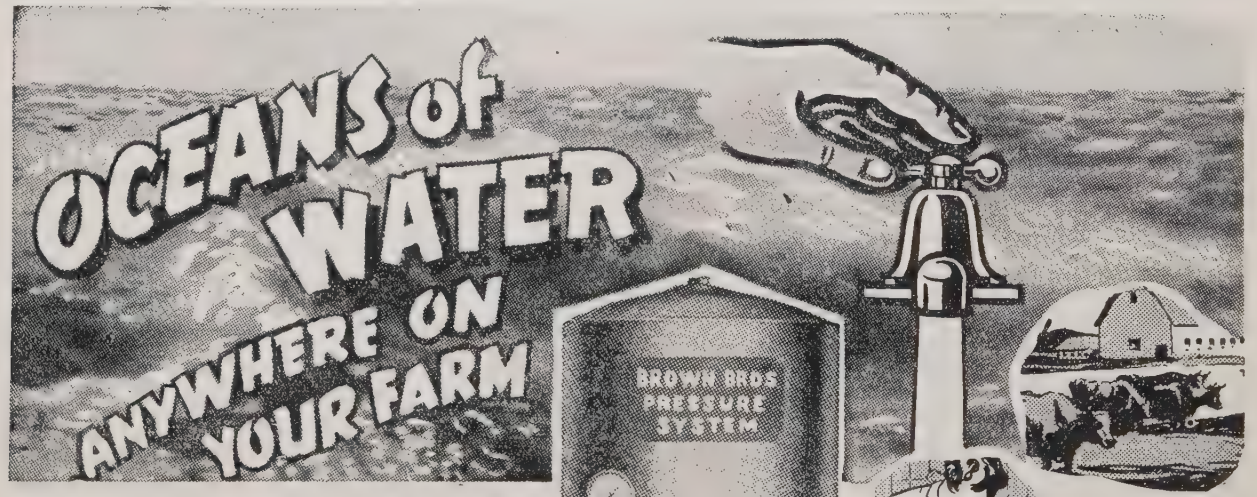
country. "Common names," however, vary, not only from country to country, but also from district to district. Thus, the plant *Plantago lanceolata* in some parts is known as plantain, while in others it is called ribgrass, lambs' tongue, or soldiers. The position is similar with the naming of many of our weeds, and is often of little account. Confusion, however, frequently does arise when one name is applied by different people to different plants. For example, the name "wart cress" is used commonly in connection with at least four different plants. For these reasons heated arguments often arise regarding the names of weeds. In many cases both parties are quite right in that the name by which they know the plant is the one most commonly used in the district.

There does not appear to be any way of obtaining uniformity of "common names" for plants. Old names die hard, and a change of name is distasteful. Botanical names are frowned on by most people, perhaps not without some justification, as many are tongue twisters. There are, nevertheless, many botanical names that are in common use by farmers and gardeners, and include such as *convolvulus, paspalum, phalaris, Lotus major, Eschscholtzia.*

For the foregoing reasons, it cannot be hoped that the names of every weed described will meet with the approval of everyone. An endeavour, however, has been made to use the commonest and most descriptive name in each case. Where several names are in common use these are all given.



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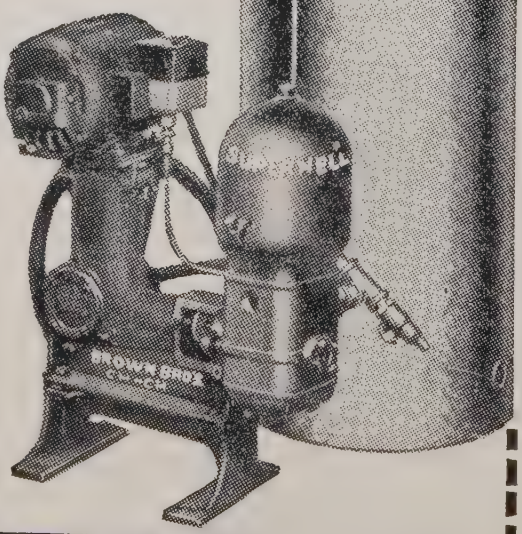

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How Liquid Manure Has Assisted Carrying Capacity and Sward Improvement

By

J. M. HOPKINS,
Instructor in Agriculture,
New Plymouth.

THE shortage of phosphates has created a renewed and keen interest in the use of cow shed and yard washings as a topdressing for pastures and for manuring areas intended for crops. The value of this liquid manure has long been realised by individual farmers, and sumps and distributors have been in use on their farms for a number of years. In the "Journal of Agriculture" for August Mr. G. A. Blake, Instructor in Agriculture, Stratford, points out how a Cardiff farmer has increased his carrying capacity and how this increase was due to the topdressing of 55 acres with liquid manure.

Photo above—
A view of the Egmont Village County, with Mr. A. R. Longstaff's farm in the foreground. The liquid manure sump and the pig fattening house are in the foreground of the buildings.
[J. M. Hopkins, photo.

In North Taranaki there are several farmers who have used liquid manure for a number of years, one of whom is Mr. A. R. Longstaff, of Egmont Village. In the "Journal of Agriculture" for August, 1939, Mr. A. G. Elliott, Crop Experimentalist, gave a brief description of the plant and experiences of this farmer, and it is felt that at this time a further and more detailed account will not be out of place.

The farm of 72 acres is situated on the New Plymouth-Stratford highway approximately one mile from Egmont Village, and when first taken up was in a very run-down condition and was badly infested with blackberry growth. Further, the land is broken to some

One of the hay-fields (left-hand corner) which has been dressed many times. The colour of this field is indicated by comparison with other fields.
[J. M. Hopkins, photo.

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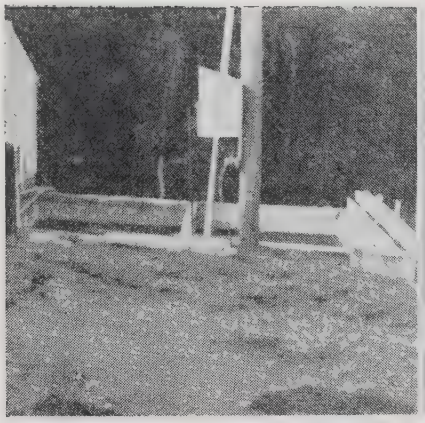
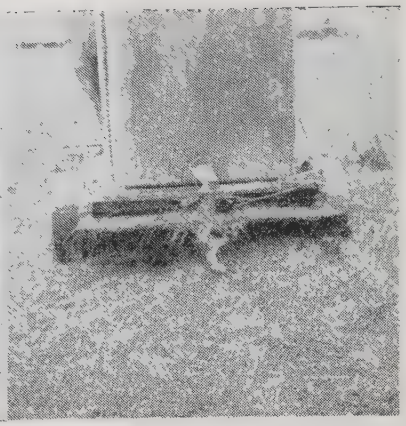


A view of the double sump showing the electric pump installed in a well midway between the two sumps.
[J. M. Hopkins, photo.

The electric pump in operation. This fills a two hundred gallon tank in one minute and a half.
[G. A. Blake, photo.



The method of distribution first adopted by Mr. Longstaff. The same tank is now used on a motor lorry.
[G. A. Blake, photo.

extent by gullies, and access from one part of the farm to another was difficult. Today very little blackberry growth exists on the property, and access to every part of the farm has been provided by good crossings.

It is interesting to mention that Mr. Longstaff has the ambitious plan of putting many of the small creeks underground by means of slab drains and then levelling off the land, and already a considerable amount of this work has been carried out. In February, 1940, severe flooding after heavy rains in North Taranaki gave drains and culverts on the farm a severe test, and all took the rush of water satisfactorily.

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ACID AND ALKALI PROOF WITH FEW EXCEPTIONS
ODOURLESS—NO FUMES
WILL NOT CONTAMINATE WATER
NON-INJURIOUS TO FISH, PLANT AND ANIMAL LIFE

Particulars from { **Wright, Stephenson, & Co., Ltd.** **Abraham & Williams Ltd.**

Distributors for: **Emulsified Asphalts (N.Z.) Ltd.**

deep with a capacity of 15 tons, and an electric pump in a well 2 ft. x 3 ft. on the side and midway between the two sumps is used to pump the liquid into the distributor. The well is equipped with outlets so that the material can be either mixed or one sump can be emptied at a time. Generally, the material from the pig fattening pens is allowed to mix with the cow yard manure, the proportions being in the vicinity of one part pig manure to three of cow yard manure, and both sumps are emptied at the same time.

It is interesting to note that all cow shed and yard washings are brought 84 feet with an 18-inch fall through 6-inch pipes and no blocking has ever taken place. For spreading the liquid manure a 200-gallon tank mounted on a konaki was used for three seasons, but now that better access has been provided on the farm, the same 200-gallon tank is used on a motor-lorry, allowing for quicker spreading and complete emptying of the sump in approximately six hours.

Topdressed Area

Since the installation of the liquid manure sump Mr. Longstaff has topdressed 25 acres of the farm with liquid manure, two fields handy to the shed being dressed many times and three other fields four or five times each. At the same time, all fields dressed in this manner have had applications of artificial fertiliser, the types used being mixtures of superphosphate and potash, basic slag and potash and proprietary mixtures. On an average, 12 tons of artificial manure per year have been used on the farm over a number of years, and the average amount of liquid manure applied each year is 500 tons.

Dressings of liquid manure are considered as extra to artificials, and all fields so treated show excellent swards of grass and clover, and at the same time are of a good colour. The two fields handy to the shed have been cut continuously for hay crops, and in these fields a good sole of grass and clover has been maintained, and it is considered this has been made possible only by extra dressings with liquid manure.

Stock Carried

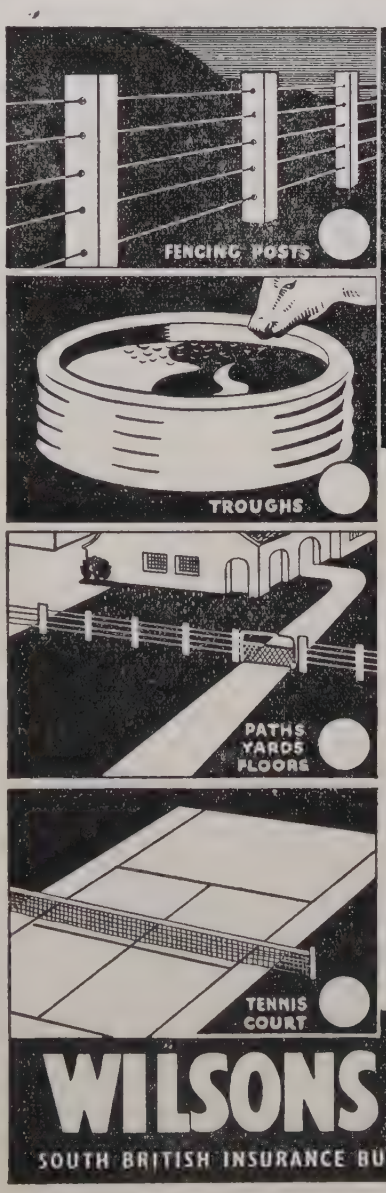
At the present time the stock carried on the 72 acres is 53 cows, two bulls, nine two-year-old heifers, and 13 yearlings, and when it is considered that five acres per year are out of grass through cropping and development programmes, this is indeed an excellent carrying capacity on the type of country in the particular locality. All replacements in the dairy herd are made from stock bred on the farm.

In his farming programme Mr. Longstaff considers that the outlay in the installation of the liquid manure sump and distributor has more than paid, and that the carrying capacity and general condition of the farm have been assisted to a considerable extent by the use of this liquid manure as a pasture topdressing. When the original state of the farm is taken into consideration, there is no doubt about this statement, and the sole of grass and clover on these fields which have been treated with liquid manure is certainly more outstanding than on those fields treated with artificials alone. All fields on the farm, however, have an excellent appearance, a fact that is very often favourably commented on by many passersby.

Combined with good management and the best utilisation of all pasture growth, liquid manure certainly has a place on all dairy farms, and this valuable manure should never be wasted. Mr. Longstaff's only regret is that he did not start on this form of manuring pastures much earlier than he did.

CORRECTION.

In paragraph (5) of the summary of the article "Cobalt Deficiency in Sheep" in the October issue, "one gallon of water" should read "**two** gallons of water."



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CONCRETE made with Wilsons Cement will save you time and money, and increase the value of your property. If you would like a free booklet showing how to make any of the alongside items, tear out this advertisement, put an X in the circle that interests you, sign your name and address and post in unsealed envelope (1d. stamp) to Wilsons.

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THE Director-General's PAGE

Linen Flax Reports

FAVOURABLE reports have been received from the United Kingdom Ministry of Supply on the first shipment of New Zealand linen flax to arrive in England. A communication which has reached New Zealand states:—"Your grading is good and satisfactory, and if you can continue on these lines New Zealand flax will be welcomed here and go readily into consumption. I am very grateful for the start you have made, and I hope that you may be able to keep up the good work."

THE detailed report of one British firm on a shipment reads as follows:—

"This flax arrived about the middle of August. Part of it was received in damp condition. We immediately opened up the bales and spread the damp flax, and it is now pretty well dry. There are about 5 cwt. of it which is somewhat caked, but the prompt handling in our opinion saved the flax, and we would be prepared to take it over along with the sound against hosepipe licenses mentioned in your letter of July 31. On the whole, we think quite a lot of the grading of the New Zealand flax.

"The *tank retted* is perhaps a little more warpy than demi. It has a good deal of gum left on but is strong, good yielding, well cleaned warp flax. So far as grading is concerned, we would classify the C, D and E as equal to a B, C and D Courtrai Waterret, but the flax is quite suitable for spinning hosepipe yarns.

"The *dew retted* is even better graded than the tank retted because the graders have not gone above Grade II, III and IV, while Grade 6X is even flax suitable for hackling, and not unlike some Courtrai Grade V's.

"*Green Flax.* This natural flax is well worked, better than some of the English standards, and we could use both the 5's and the 5X for warp.

"The condition of the material after press packing was quite satisfactory. Several bags had been press packed and hooped together, but not under pressure which would damage the material."

Blood and Bone Supplies

CONSEQUENT on representations made to the Department of Agriculture by market gardeners and others, it has become necessary to consider the rationing of blood and bone to ensure adequate supplies to bona fide market gardeners.

This proposal has been submitted to the National Council of Primary Production, which has approved of the principle, and arrangements are now being made to issue the necessary instructions to freezing companies to safeguard supplies.

Collection of Ergot

GOOD progress is being made with the campaign for the collection of ergot. Among the organisations which have promised their support are the Women's Division of the Farmers' Union, the Women's Institutes, the Grain and Seed Merchants' Association, the Girl Guides, the Boy Scouts, the Young Farmers' Club, and the Education Department is conducting propaganda through the schools.

Large quantities of this valuable drug are urgently needed by the United Kingdom, and it is hoped that the collection will be a truly national one.

Enjoy a lighted home equal to city residents, with your own lighting unit. While your milking engine is running it can be providing electric power at next to nothing! Write for our catalogue and full instructions and you can install your own electrical system.

AT PRACTICALLY NO COST!

ELECTRIC BULBS—We have ample stocks of 6, 12, 18 and 32 volt bulbs to provide our customers with their several requirements.

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The collection must be confined to two species of grass, tall fescue and marram grass, as the ergot in other species has been found to be unsatisfactory, Wherever either of these two varieties of grass are growing a close watch should be kept on them, and, once the ergots have ripened, a start should be made with their collection.

A pamphlet on the harvesting and collection of ergot is obtainable from the Department of Agriculture, and further information may be obtained from any Instructor in Agriculture. Ergot may be sold to any grain or seed merchant.

Export of Grass and Clover Seed

THE policy adopted in regard to the export of grass and clover seeds from New Zealand is aimed at the minimum restriction of business in order that merchants cabling offers of seeds overseas can be reasonably assured in advance that export permits will be recommended.

At the beginning of the year a "free list" of seeds which could be exported was issued to Customs Officers at all ports. The list was as follows:—

Ryegrass perennial.—Uncertified; Certified Commercial; Certified Permanent Pasture; Certified Mother Seed; Certified Pedigree.

Ryegrass Italian.—Uncertified; Certified Commercial; Certified Mother Seed.

Western Wolths.

Cocksfoot.— Uncertified; Certified Permanent Pasture; Certified Mother Seed.

White Clover.—Uncertified; Certified Permanent Pasture; Certified Mother Seed.

Red Clover.—Uncertified (including cowgrass); Broad (Certified); Montgomery—Certified Permanent Pasture; Montgomery—Certified Mother Seed.

Suckling Clover.—Uncertified.
Browntop.—Certified.
Crested Dogstail.
Chewings Fescue.
Yorkshire Fog.

For all other grass and clover seeds it has been necessary to apply for export permits.

The seeds for which permits have not been granted include Nucleus and Government Stock Perennial Ryegrass, Certified Pedigree Cocksfoot, Certified Pedigree White Clover, and Certified Pedigree Montgomery Red Clover. No permits have been granted to export seeds which are normally imported to New Zealand, such as root and forage crop seeds, timothy, alsike and subterranean clover.

The Director-General and Staff of the Department of Agriculture extend to all readers and advertisers the Compliments of the Season

A survey of stocks early in the year showed that there was a surplus of Uncertified Rape Seed and limited quantities of this have been exported.

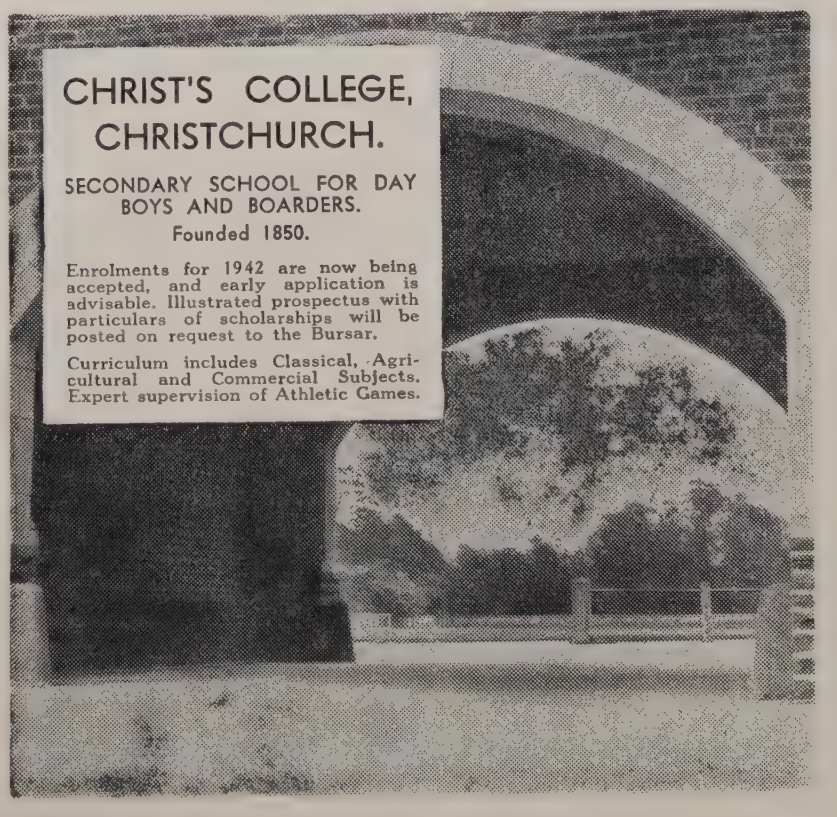
There was at the request of the British Ministry of Agriculture a limited shipment of Certified Rape Seed made to Great Britain.

Because of the short crops harvested this year, no permission has been granted to export lucerne seeds or yarrow. Exports of peas of all varieties and of linseed have been freely granted.

As far as possible the importation of all varieties of seed has been reduced to a minimum, but it is the Departments' wish to allow all merchants an equitable share of any importations.

There are certain varieties of seed which were formerly imported to New Zealand from time to time, but which are now prohibited. These include red top, Indian Doobj, *Poa pratensis*, *Poa trivialis*, Meadow foxtail, and others, but it is considered that these are of negligible importance to our farming community.

Restrictions on the importation of red clover, lucerne and *Lotus major* are aimed at the protection of local growers. Only limited importations of subterranean clover and paspalum can be granted, and in regard to paspalum it is suggested that some effort should be made this year towards the saving of seed in suitable districts such as North Auckland and the coastal districts of Wellington Province.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Enrolments for 1942 are now being accepted, and early application is advisable. Illustrated prospectus with particulars of scholarships will be posted on request to the Bursar.
Curriculum includes Classical, Agricultural and Commercial Subjects. Expert supervision of Athletic Games.

Lambing Estimates for 1941

Greatest Number of Ewes on Record And Highest Lambing Percentage

Contributed by the LIVESTOCK DIVISION.

FOR the first time in the history of the Dominion the estimated lambing percentages have exceeded 90 per cent. for two years in succession, and this year's estimated percentage of 91.11 is the highest yet recorded.

The number of breeding ewes is also a record. Never before has the recorded number of breeding ewes exceeded 20,000,000.

In the last five years the South Island returns have been consistently higher than those from the North Island, but this year the North Island has experienced a good season, while the South Island figures have been well sustained.

County.	Breeding Ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
Auckland District.			
Mangonui	33,111	86.01	28,479
Whangaroa	13,662	73.22	10,003
Bay of Islands	60,793	88.00	53,498
Hokianga	54,527	84.10	45,857
Whangarei	100,347	87.66	87,964
Otamatea	75,754	85.59	64,838
Hobson	69,958	80.68	56,442
Rodney	82,007	79.37	65,089
Great Barrier	7,169	64.98	4,658
Waitemata	67,146	89.12	59,841
Eden	2,314	101.39	2,346
Manukau	61,023	96.00	58,582
Franklin	96,399	100.00	96,399
Coromandel	39,416	76.81	30,275
Thames	10,114	78.73	79,628
Hauraki Plains	12,775	93.67	11,966
Ohinemuri	10,953	86.96	9,525
Waikato	134,971	95.47	128,857
Raglan	343,133	85.94	294,889
Waipa	154,784	98.62	152,648
Piako	98,411	98.28	96,718
Matamata	183,427	101.90	186,912
Rotorua	67,887	98.00	66,529
Taupo	19,571	90.00	17,614
Taumarunui	90,680	86.65	78,574
Kawhia	56,996	90.36	51,502
Otorohanga	118,599	93.57	110,973
Waitomo	300,472	88.00	264,415
Auckland District—Cont.			
Ohura	105,365	90.75	95,619
Kaitieke	57,802	83.50	48,265
Tauranga	92,872	97.02	90,104
Whakatane	40,409	87.85	35,499
Opotiki	52,626	78.00	41,048
Totals	2,715,473	93.00	2,525,556
East Coast-Hawke's Bay District.			
Matakaoa	63,379	77.00	48,802
Waiapu	252,799	79.00	199,711
Uawa	127,970	86.00	110,054
Cook	443,179	85.00	376,702
Waikohu	368,102	81.00	298,163
Wairoa	410,897	84.00	345,153
Hawkes Bay	929,939	87.00	809,047
Waipawa	392,574	93.00	365,094
Waipukurau	128,147	96.00	123,021
Patangata	499,491	88.00	439,552
Weber	53,259	96.00	51,129
Dannevirke	269,467	96.00	258,688
Woodville	80,378	99.00	79,574
Pahiatua	157,724	98.00	154,570
Akitio	160,172	82.00	131,341
Totals	4,337,477	87.39	3,790,601
West Coast-Wellington District.			
Clifton	71,377	91.00	64,953
Taranaki	18,404	99.00	18,220
Inglewood	37,675	96.00	36,168
Egmont	21,029	104.00	21,870
Stratford	80,134	89.00	71,320
Whangamomona	47,378	87.00	41,219
Eltham	50,297	94.00	47,279
Hawera	75,613	95.00	71,832
Waimate West	5,684	98.00	5,570
Patea	200.278	96.00	192,267
Waitotara	134,955	90.00	121,460
Waimarino	169,112	87.00	147,127

County.	Breeding Ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
West Coast-Wellington District—Cont.			
Wanganui	261,680	89.00	232,895
Rangitikei	948,933	95.00	901,486
Oroua	203,784	104.00	211,935
Kairanga	109,377	100.00	109,377
Kiwitea	229,073	96.00	219,910
Pohangina	117,795	92.00	108,371
Manawatu	146,150	107.00	156,381
Horowhenua	116,009	96.00	111,369
Hutt	72,390	80.00	57,912
Makara	44,515	85.00	37,838
Featherston	315,698	90.00	284,128
Wairarapa South	162,098	86.00	139,404
Masterton	295,884	90.00	266,296
Castlepoint	96,452	83.00	80,025
Eketahuna	138,514	84.00	116,352
Mauriceville	45,146	79.00	35,665
Totals	4,215,434	92.72	3,908,629
Marlborough-Nelson-Westland District.			
Waimea	168,128	73.52	123,608
Takaka	26,558	82.65	21,950
Collingwood	13,199	77.42	10,219
Buller	2,487	92.49	2,300
Inangahua	13,534	104.08	14,086
Murchison	32,565	90.83	29,579
Grey	24,764	109.04	27,007
Westland	36,066	109.50	39,492
Sounds	101,456	62.29	63,197
Marlborough	195,771	79.09	154,835
Awatere	205,875	86.69	178,473
Totals	820,403	81.03	664,746
Canterbury-Kaikoura District.			
Kaikoura	112,418	79.00	88,810
Amuri	228,670	65.00	148,636
Cheviot	145,070	91.00	132,014
Waipara	283,603	84.30	239,078
Ashley	63,146	64.65	40,824
Kowai	66,359	93.86	62,285
Oxford	71,258	80.00	57,006
Rangiora	33,220	95.00	31,559
Eyre	49,569	103.00	51,056
Tawera	51,924	80.50	41,799
Malvern	111,652	97.00	108,302
Paparua	29,946	90.00	26,951
Waimairi	4,193	100.00	4,193
Heathcote	10,333	96.00	9,920
Akaroa	86,275	106.98	92,297
Mt. Herbert	40,410	98.30	39,723
Wairewa	71,456	98.21	70,177
Halswell	13,298	105.95	14,089
Springs	26,206	103.61	27,152
Ellesmere	78,337	100.24	78,525
Selwyn	144,544	87.50	126,476
Ashburton	647,761	98.84	640,247
Geraldine	231,694	81.85	189,642
Levels	144,414	103.30	149,180
Mackenzie	304,723	83.00	252,920
Waimate	431,309	99.00	426,996
Chatham Islands	41,003	73.00	29,932
Totals	3,522,791	90.26	3,179,789

County.	Breeding Ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
Otago-Southland District.			
Waitaki	416,955	87.20	363,585
Maniototo	249,853	93.90	234,612
Vincent	254,222	93.50	237,698
Waihemo	94,422	82.00	77,426
Waikouaiti	65,433	96.05	62,848
Taieri	164,635	85.60	140,928
Peninsula	15,698	103.10	16,185
Clutha	385,263	94.50	364,074
Tuapeka	323,179	92.50	298,941
Bruce	213,059	91.53	195,013
Lake	133,333	82.67	110,226
Southland	1,541,199	103.42	1,593,908
Wallace	560,210	86.50	484,582
Stewart Island	1,894	80.00	1,515
Totals	4,419,355	94.62	4,181,541

District Estimates.

The following table gives the estimates of the current (1941) season's lambing for the several sheep districts:—

District.	Number of Breeding Ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
Auckland	2,715,473	93.00	2,525,556
East Coast-Hawke's Bay	4,337,477	87.39	3,790,601
West Coast-Wellington	4,215,434	92.72	3,908,629
Marlborough-Nelson-Westland	820,403	81.03	664,746
Canterbury-Kaikoura	3,522,791	90.26	3,179,789
Otago-Southland	4,419,355	94.62	4,181,541
Dominion	20,030,933	91.11	18,250,862

Dominion Totals

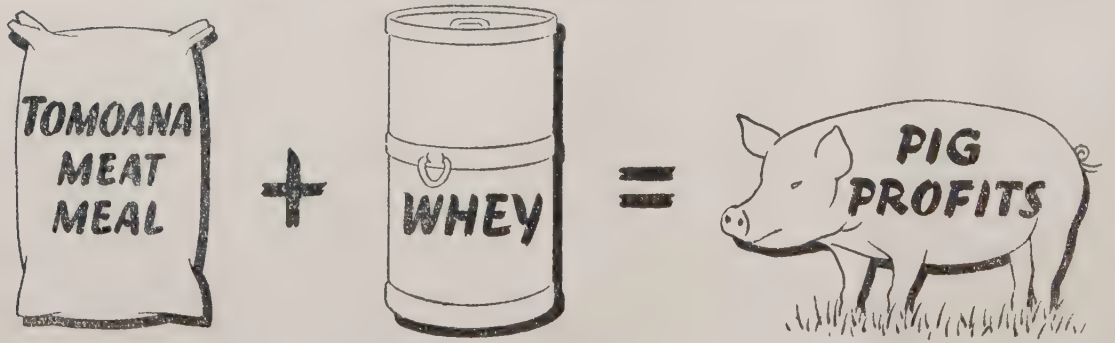
The following table shows the estimated lambing for the North and South Islands for the previous five years, together with the actual number of lambs tailed:—

Year.	Number of Breeding Ewes	Estimated Percentage of Lambs.	Estimated Number of Lambs.	Actual No. of Lambs Tailed.
North Island.				
1941	11,268,384	90.74	10,224,786	—
1940	10,917,684	89.01	9,717,488	10,348,649
1939	10,889,802	84.40	9,190,794	9,476,647
1938	10,735,829	80.11	8,600,625	9,034,385
1937	10,570,388	86.52	9,145,849	9,401,496
1936	10,300,826	90.50	9,322,476	9,387,749
South Island.				
1941	8,762,549	91.60	8,026,076	—
1940	8,809,973	91.69	8,078,518	8,037,123
1939	9,070,497	86.29	7,826,601	7,752,922
1938	8,928,037	90.10	8,044,540	7,914,594
1937	8,761,689	91.35	8,003,668	7,939,418
1936	8,368,135	90.10	7,539,576	7,478,278
Dominion.				
1941	20,030,933	91.11	18,250,862	—
1940	19,727,657	90.21	17,796,006	18,385,772
1939	19,960,299	85.26	17,017,395	17,229,569
1938	19,663,866	84.64	16,645,165	16,948,979
1937	19,332,077	88.71	17,149,517	17,340,914
1936	18,668,961	90.32	16,862,052	16,866,021

Your Whey is Worth 3/4d per gallon!

Recent feed trials at Hamilton conducted by the Waikato District Pig Council under the supervision of Mr. C. P. Harington, showed that whey, when fed with Tomoana Meat Meal, is worth .76d. per gallon. This was after deducting the cost of Tomoana, the only Meal fed with the whey.

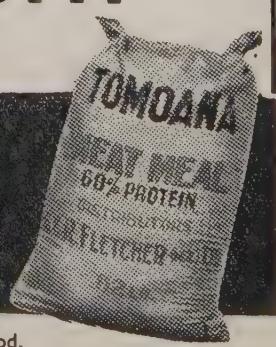
The cost in Tomoana Meat Meal for each lb. of pig flesh produced was 1.32d., *i.e.* for every 1.32d. invested in Tomoana, 6d. to 7d. was returned in pig flesh.



·88 lbs. of Tomoana costing 1·32d.	*plus*	6¼ gallons of whey (average).	*produces*	1 lb. of pig flesh worth 6d. to 7d.

TURN WHEY INTO PROFIT

by feeding in conjunction with



TOMOANA MEAT MEALS

For further information regarding the profitable use of whey as a pig food, write Messrs. W. & R. Fletcher (N.Z.) Ltd., P.O. Box 663, Wellington.

WHEY for Pig Production is as Good as You Make It

Contributed by the National Pig Industry Council.

WHEY for pigs has recently been pushed into the limelight, and is likely to stay there for some time. The many farmers who have been regular suppliers to cheese factories have found that whey can be used profitably. Farmers who have formerly supplied butter factories and who now find themselves suddenly faced with a change-over to cheese are in many instances doubtful about the value of whey by comparison with skim-milk for pig feeding. There is no need to have any doubts. Whey is valuable.

Here are the facts. The amount of whey and the feed units content, together with the pig-meat production from a stated weight of cheese per cow, are shown first. Figures have a theoretical taste, but this basis of reasoning is necessary to provide a sound foundation for calculation. The results shown here have been obtained so often on farms that no one can have any excuse for questioning them.

How much whey per cow?

The average cow produces 500 gallons of milk.

500 gallons of milk produces 500 lb. of cheese.

500 lb. of cheese produces 375 gallons of whey.

375 gallons of whey produces 280 lb. of pig-feed.

If this 280 lb. of pig-feed can be used so that every 6 lb. of feed produces 1 lb. of pig-meat, that is, 280 lb. of feed produces 47 lb. of pig-meat, whey has a value of approximately ¾d. per gallon. It will be shown that, when fed along with meals and home-grown crops, whey does return approximately this amount after the meals and crops are paid for.

Can we afford to throw away a by-product that is worth ¾d. a gallon?

On the average farm it is almost impossible to feed whey satisfactorily without using meals and roots. These three feedstuffs make a satisfactory combination, and the costs of the rather expensive meals are offset by the cheaper roots and grass. In no circumstances should the use of meals and roots with whey reduce the earning value of whey.

Where conditions and management are reasonable, six tons of feed will produce one ton of pig-meat. Where these are good, four to five tons of feed produce one ton of pig-meat.

A sow giving seven pigs per litter and two litters a year (one litter as bacon and one as pork) eats 4½ tons of feed and produces ¾ ton of pig-meat.

Thus—

Seven 90 lb porkers equals 630 lb of pig-meat.

Seven 150 lb. baconers equals 1050 lb. of pig-meat.

Total, 1680 lb.

At 6d. per lb., this is worth £42, and is the return for 4½ tons of feed.

This 4½ tons is made up of whey, meal, and roots or grazing. To show how it is used, the following table is supplied. This is based on the following general principles:—Sows before farrowing need 6 to 10 gallons of whey and 2 to 3 lb. of meat-meal daily; sows with litters should get 10 to 20 gallons of whey and 3 to 4 lb. of meal; suckers should get 1 pint to 2½ gallons of whey and 2 to 8 oz. of meal, depending on size; stores and porkers should get 2½ to 5 gallons of whey and ½ to 1 lb. of meal; and baconers 6 to 8 gallons of whey with 1 to 1½ lb. of meal daily.

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HESKETT SLAG

Many soils of high-rainfall parts of New Zealand lack Lime, and contain large quantities of Iron and Allumina, which rob the farmer of about four-fifths of every ton of Water-Soluble Phosphates spread on these soils; a Basic Slag contains, among other minerals, large quantities of a non-acid chemical compound known as Calcium-Silico-Phosphate which, it is claimed, has the power of unlocking these dormant minerals from the soil. The phosphates of a Basic Slag cannot be locked up by these soils because they are already combined in a form easily digested by the root acids as they need them.

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Amount of Feed Used

With these standards as the basis of feeding when whey is plentiful, the following amounts of feed will be used for a litter taken to the weaner stage, the pork stage, or the bacon stage:—

A sow and her two litters consume in a year a total of 10,910 lb. of feed; one litter to pork requires 3,956 lb., and the other litter to bacon requires 6,954 lb. of feed. This is slightly in excess of 4½ tons of feed as originally stated.

Rate of Feeding.	Amount Fed. Gals. whey.		Lb. feed.	Lb. meal.	Total feed.
Sows before farrowing 120 days:					
6-10 gals. whey, 2 lb. meal daily	960	=	720	240	960
Sows suckling 56 days:					
10 to 20 gals. whey, 3 lb. meal daily	840	=	630	168	798
Seven suckers in creep 56 days:					
1 pint to 2½ gals. whey, 2 oz. to 8 oz. meal	371	=	280	77	357
Sub-total to the weaner stage	2,171	=	1,630	485	2,115
Seven weaners to pork 70 days:					
2½ to 5 gals. whey, ½ to 1 lb. meal	1,960	=	1,470	371	1,841
Sub-total to porker stage	4,131	=	3,100	856	3,956
Seven porkers to bacon 70 days:					
5 to 8 gals. whey, 1 to 1½ lb. meal	3,185	=	2,389	609	2,998
Total to bacon stage	7,136	=	5,489	1,465	6,954

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Also incorporated is a substantial proportion of pure Rock Asbestos Fibre, the whole forming an extra tough resilient composition which cures in a seamless, durable blanket.

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From a study of these figures, the first interest is that a **weaner** uses 310 gallons of whey and 70 lb. of meal; a **porker** 590 gallons of whey and 123 lb. of meal; and a **baconer** required 1,045 gallons of whey and 210 lb. of meal.

With meals at £14 a ton, the relative costs for purchased feed is—

For a—	
Weaner	8/9
Porker	15/4
Baconer	23/3

Supplementary Feed

When whey is in short supply there is usually little grass that is any use to pigs, so it is necessary to have a supply of roots, either for the early litters in May to August, or for weaners, stores, and porkers from February till the end of May. The whey supply is changing from day to day, and roots should be provided at the rate of 5 lb. to 7 lb., depending on the kind of roots used, for every gallon of whey in short supply. If only 3 gallons of whey is available for sows before farrowing, the sow should get 20 lb. to 25 lb. of roots daily or this equivalent in grass. If there is only 5 gallons of whey daily for the sow after farrowing, she needs 30 lb. to 40 lb. of roots as well. Suckers can eat ½ lb. to 1 lb. of roots daily to replace their pint of whey, and at weaning can eat 5 lb. to 7 lb. to replace 1 gallon of whey. Porkers can eat 8 lb. to 15 lb. of roots, and baconers up to 20 lb. of roots, daily to replace the corresponding amount of whey. Provided the amount of meal set out in the table is used daily and roots are added to make up for the whey that is not available, pigs will grow almost as fast on roots and whey as they would if they were getting all the whey they can drink.

Making allowance for the fact that whey has to be supplemented by roots when there is not enough of it, and that some use will be made of grass even when whey is abundant, the 10,910 lb. of feed could be supplied as follows:—

		Feed units.
Whey 8,500 gallons	equals	6,375
Meal 2,331 lb.	equals	2,331
Roots or grass, 22,040 lb. (10 tons)	equals	2,204
Total feed	equals	10,910

Returns per Cow

On the basis of 375 gallons of whey per cow as stated earlier, the 8,500 gallons of whey will be obtained from 22

cows. The production from this quantity of whey when meal and roots are used is three-quarters of a ton of pigmeat worth £42 at 6d. per lb. When allowance is made for the meal purchased at £14 per ton and the roots and grass at 5s. per ton, a total of £17, the net return for the whey is £25.

Are 10 Tons of Roots Too Much?

The question might be asked, can a sow and her progeny eat 10 tons of roots in 12 months? Trials carried out at Ruakura Animal Research Station show that a pig can eat its own weight of roots or grass in a week. A pig of 70 lb. liveweight can eat 10 lb. of roots daily; one of 150 lb. can eat 20 lb.; sows can easily consume 50 lb. of roots daily. Many farmers turn their sows out after weaning to come in off the grass in three or four months' time in the pink of condition. As a sow requires at last 5 lb. of feed daily during this period, she must necessarily consume 40 lb. to 50 lb. of grass or roots a day when no other feed is fed. At a much lower rate of feeding, as set out below, the 10 tons of roots are easily used as follows:—

Sows before Farrowing (120 days)	
Two periods of gestation: 240 feed days, 30 lb. daily	7,200 lb.
Sows after Farrowing (56 days)	
Two periods of suckling: 112 feed days, 15 lb. daily	1,680 lb.
Pigs from Weaning to Pork (70 days)	
Two litters of seven pigs: 980 feed days, 8 lb. daily	7,840 lb.
Pigs from Pork to Bacon (70 days)	
One litter of seven pigs: 490 feed days, 12 lb. daily	5,880 lb.
Total	22,600 lb

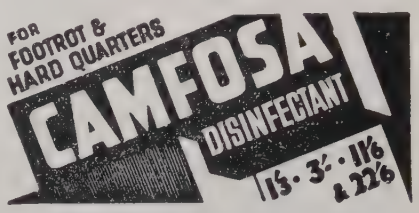
This means approximately 10 tons, or 2,260 lb. as feed units.

It will be understood that as different varieties of roots have different feed values, the kind of root crops grown will have a bearing on the tonnage required. The figures shown are for swedes, mangels, pumpkins, and kumi kumi; with carrots the quantity could be reduced by 20 per cent.; sugarbeet, potatoes, or artichokes, due to their higher feeding values, would reduce the amount of roots necessary by nearly half.

Must Use Other Feeds

Whey as a sole feed can never be profitable, and its use without other feeds will result in unthrifty, unprofitable pigs. This has given rise to the oft-expressed opinion that whey as a pig feed is not worth the trouble of carting from the factory. When used together with the right amounts of the proper supplements, its value approaches that of skim-milk.

Whey is as good as you make it. It will show profits only when it is properly used. This, however, is not peculiar to whey; it applies to all things.



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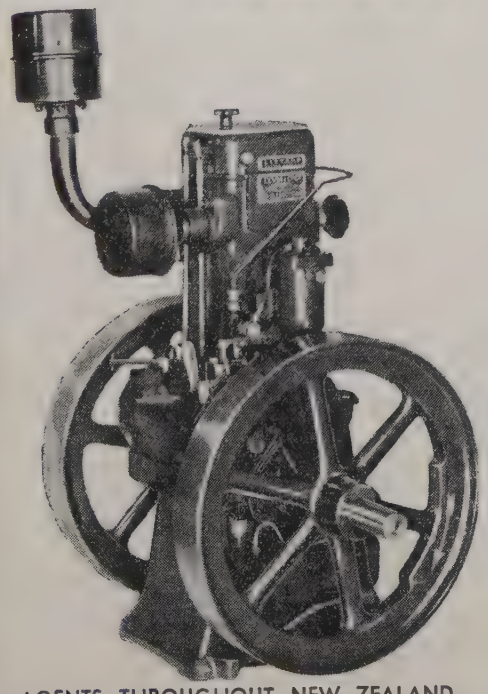

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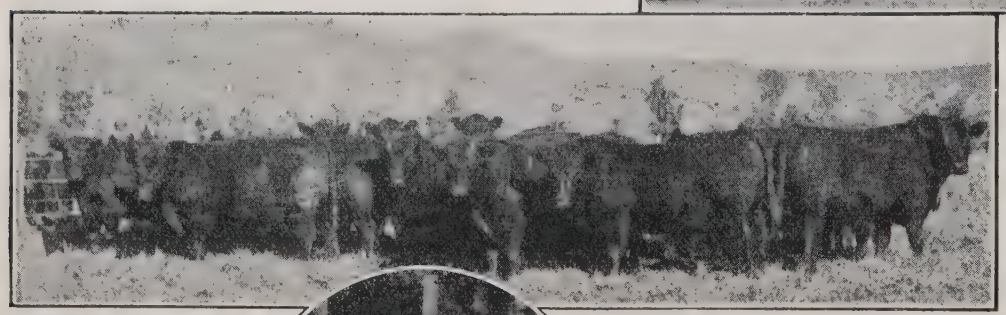

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The PULSATOR

(Continued from the November issue)

By
W. G. WHITTLESTON,
Animal Research Station,
Wallaceville.

Mechanically-driven Pulsators

Mechanically-driven pulsator valves may be divided into two main classes:
(a) Reciprocating or slide valves.
(b) Rotary valves.

Reciprocating or Slide-type Pulsators

A typical slide pulsator is shown in Fig. 12. It consists of the main casting (a), in which is ground the valve face containing the ports (b) and (c). The larger port (b) connects to the vacuum line, while the other (c) is connected via the tap (d) to the pulsator down-dropper. The slide is shown at (e). This is driven by the collar (f), which is fitted to the driving rod. The assembled valve is shown in Fig. 13. The action of the valve is exactly as illustrated in Figs. 3 and 4.

In the normal set-up one such valve is used per bail (individual pulsators), a longitudinal driving rod extending the length of the shed. This has the advantage over the "master" type of pulsator, in which one valve serves several bails through considerable lengths of pipe, in that the pulsators act uniformly in all bails and give a "snappier" action.

The valve is adjusted by sliding the collar (f) on the driving rod. Moving the slide away from the port connected to the down-dropper increases the "squeeze" phase of the pulsator cycle—that is, increases the "pulsator ratio." Conversely, moving the slide towards this port increases the "release" phase—that is, decreases the "pulsator ratio." Some pulsators of this class are provided with a mechanism by which this adjustment can be effected without the use of tools.

The method of driving such pulsators varies with the make. Essentially, it is some device for transforming the rotary motion of the pump and motor into a reciprocating motion of suitable amplitude and speed. The usual speeds vary between 38 and 45 pulsations per minute, and frequently some provision is made for altering the pulsator speed without altering that of the pump. It is usual (and sound) practice to arrange the pulsator valves so that when one-half of them are in the "release" position the other half are in the "squeeze" position. Such an arrangement helps to smooth out the vacuum variations in the pulsator line due to the valves opening together.

Common Troubles

Two common causes of trouble with this type of pulsator are:—

(a) Slipping of the collar or other method of attachment on the driving

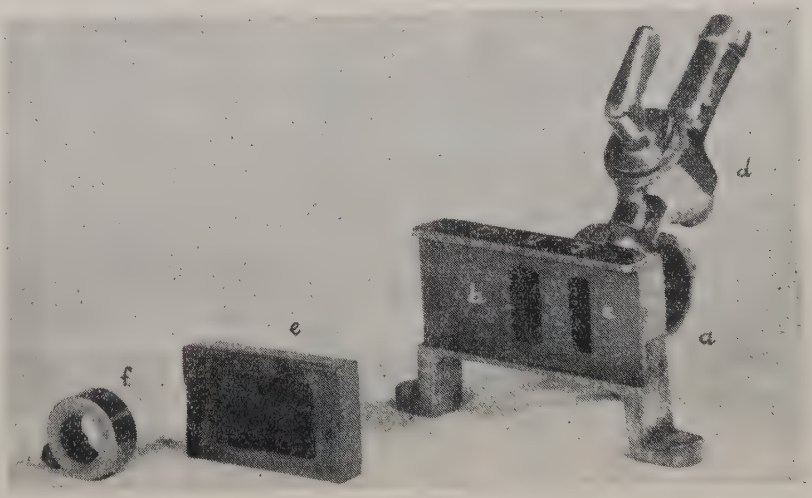

Fig. 12.—The parts of a typical slide pulsator.

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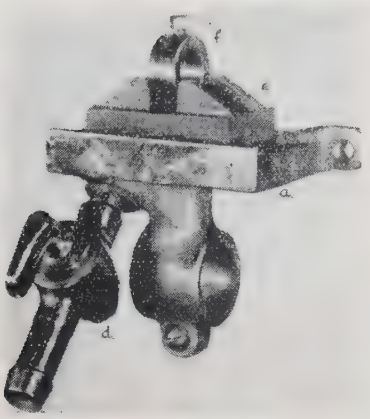
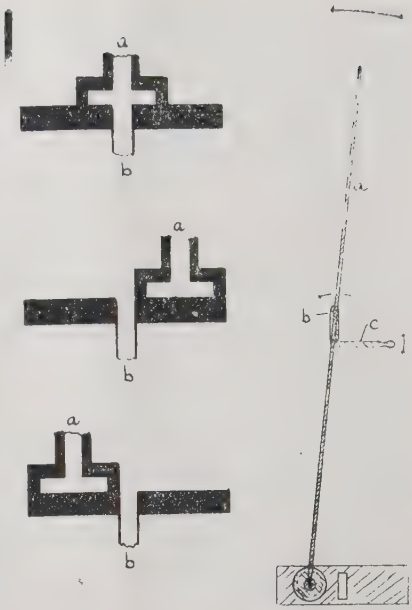


Fig. 13.—The assembled slide pulsator valve.

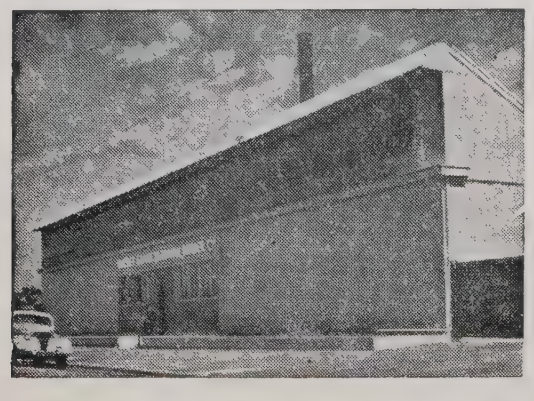
rod. This causes the ratio to change, and may put a pulsator completely out of action. This must be rectified by replacing the slide in its correct position and retightening the holding screws, etc. The correct position varies with the ratio desired and the make. In the valve illustrated the ratio is about 40:60 when the slide just clears the down-dropper port at the end of the "squeeze" phase stroke.

(b) Looseness in the rod connecting the main driving rod to the rest of the mechanism. A common type of drive employs a small crank which drives the main rod via a connecting rod. Looseness in the bearings of the connecting rod will cause the ratio to alter and the amount of opening of the valve to decrease, causing feeble pulsator action. Sometimes the driving crank shaft itself becomes loose. This may cause great changes in the ratio, and will also seriously affect the action of the pulsator. It is essential that all slackness on the pulsator drive should be avoided and ample lubrication provided to prevent undue wear.

One interesting trouble with slide pulsators on single-pipe machines arises from expansion of the milk pipe. As the pulsators on this type of machine are mounted on the milk pipe, they move with it as it expands due to the warmth of the milk passing through it. Such pulsators should be adjusted while the pipe is warm, otherwise the valves at the end of a large installation may be considerably out of adjustment after the machine has run a short time. [The piping in an eight-cow plant will expand roughly one-third of an inch on warming.]



Figs. 14 and 15.—Left: Diagram of a slightly unusual slide pulsator valve. Right: Showing how the pulsator is operated.



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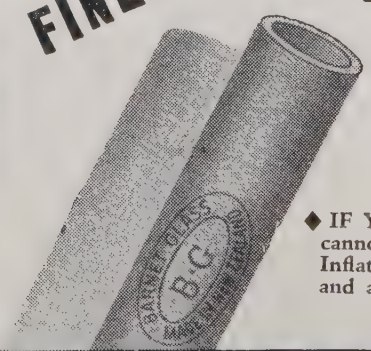

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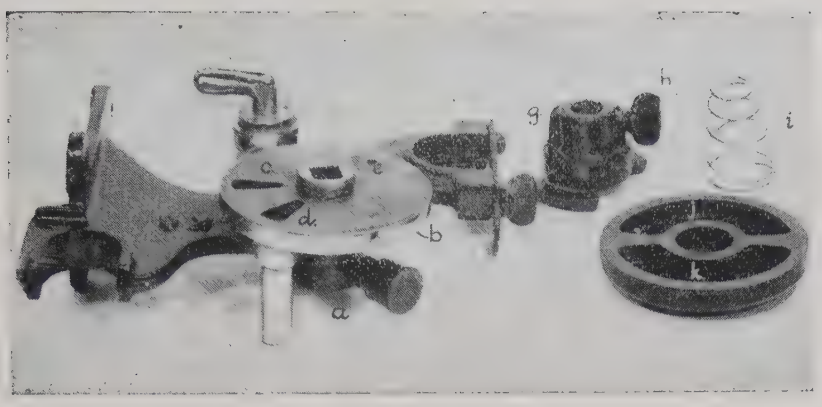

Fig. 16.—A rotary pulsator valve in pieces.

Another type of slide pulsator is that which works at right-angles to the milk pipe. Such pulsators are driven from a rotating shaft running the length of the shed by eccentrics or some similar device. These pulsators are more or less independent in that the drive to each is separate and all are not affected by any looseness in a connecting rod or some similar trouble. On the other hand, there are more moving parts to keep in order. Pulsators of this type can be arranged to operate in succession and thus even out the demand on vacuum in the pulsator line.

Unusual Pulsator

There is one slightly unusual slide pulsator worthy of mention because of its ingenuity. The valve is shown in Fig. 14 (i, ii, and iii). As can be seen, it is quite different from the slide valves previously discussed. The vacuum lead is connected to the slide at (a), while (b) connects to the claw. The two normal positions are shown in 14 (i) and 14 (ii), these positions being squeeze and release respectively. If the slide is moved past the release position of 14 (ii) to the position 14 (iii) we get another squeeze position. This pulsator is operated from the usual type of reciprocating rod by a lever (a) shown in Fig. 15. This lever pivots about a fulcrum (b), which can be moved by the bell crank (c) into several positions. Moving the fulcrum alters the movement of the slide with respect to the ports, and so alters the ratio. Further, if the fulcrum is shifted far enough the slide uncovers the claw lead port twice per complete cycle, doubling the pulsator rate. It is claimed that such a device helps in milking out cows otherwise milked with difficulty.

The pulsator valve in this case is mounted down low in the bail. There are several other arrangements in which the pulsator is thus brought near to the cups. There is one single pipe machine with a small horizontally acting slide valve on the top of a sight-glass raising bowl combination set well down in the bail. In machines employing mechanical "vacuum break" the pulsator is often combined with the pulsator slide and fitted at a low level. The main advantage of placing the pulsator slide valve near to the cup is that the action at the cups is thus made "snappier." However, in dusty sheds such pulsators will tend to suck contamination into the pulsator chamber of the cups. Further, it has been noticed when recorder diagrams have been examined from many types of machine that the size of the ports is more important than the length of the down-dropper in the case of individual pulsators.

Rotary Pulsators

A rotary pulsator valve is shown in Figs. 16 and 17. Fig. 16 shows the valve in pieces: (a) is the main casting, which is integral with the valve face (b), in which are cut three ports (c), (d), (e); (f) is the rotary valve block, which is driven by the portion (g), which is fixed by the set screw (h) to the rotary driving shaft. The spring (i) serves to apply a slight pressure to the block (f), thus holding it against the valve face. As can be seen from the figure, the valve block is shaped so that it contains two recesses (j) and (k) separated by a raised portion (l), which divides the block into two equal halves. The complete valve is shown in Fig. 17.

The action of the valve is as follows: When ports (c) and (d), which connect to the claw and the vacuum lines respectively, are covered by a recess

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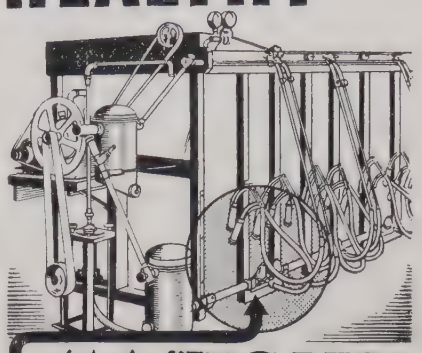

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the pulsator line is evacuated, giving the "release" position. As the block rotates the recess moves so that port (d) comes under the second recess and so is not connected to anything, while the first recess, still connected to port (c), moves above port (e). This opens the claw lead to the air, giving the squeeze phase. The cycle is then repeated by the second recess. Thus, two complete pulsator cycles per revolution are obtained. All the valves are mounted on the same rotary longitudinal shaft running the length of the shed. Such an arrangement allows the valves to be set so that they operate in succession, which evens out the demand on the vacuum by the pulsators, and makes the flow into the milk pipe more uniform than would otherwise be the case. One advantage of the rotary pulsator is the fact that the ratio is fixed. An objection to it is the fact that, due to the fairly large wearing areas and the great force due to atmospheric pressure acting on the valve blocks, considerable power is required to drive a number of such valves. When all-metal construction is used attention must be paid to lubrication.

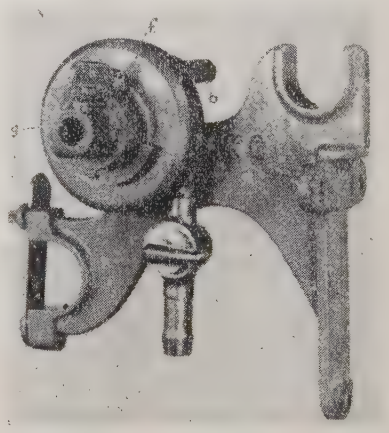

Fig. 17.—The completed rotary pulsator valve.

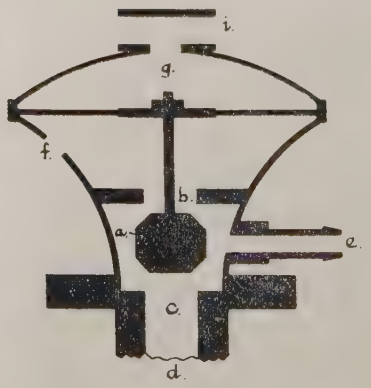

Fig. 18.—The construction of a diaphragm-operated shuttle-type pulsator.

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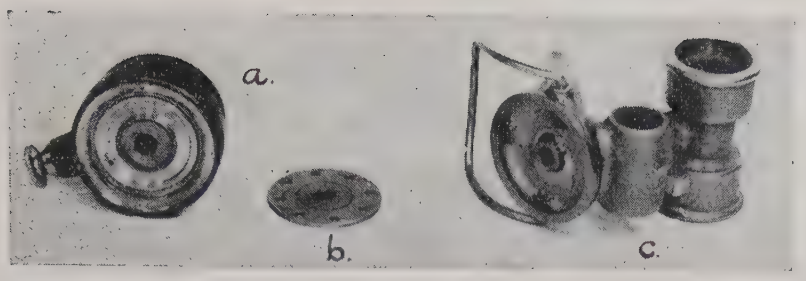

Fig. 19.—The parts of a magnetic pulsator.

Diaphragm-operated Shuttle-type Pulsator

Fig. 18 illustrates the construction of this device. The valve is a shuttle-shaped device shown at (a). It is connected to the diaphragm as shown, and seats alternately at (b) and (c). Lead (d) connects to the source of vacuum, lead (e) is the claw lead, while the space above the valve seat (b) is open to the air through port (f). The chamber (g) above the diaphragm (h) is connected via (i) to an "impulse maker." The latter is simply a rotary or other type of pulsator valve which alternately evacuates and opens the impulse line to the air. This type of valve is normally used on a single-pipe machine so that the connection (d) goes to the milk pipe.

The action of the valve is as follows:—When the chamber above the diaphragm is evacuated the valve rises, closing the upper opening at (b) and connecting the claws to the vacuum giving the release phase. The chamber (g) is then opened to the air by the "impulse maker." The diaphragm promptly falls, due to the weight of the valve and the pressure of the atmosphere acting on its upper side. The valve, therefore, seats at (c), opening the claw lead to the air.

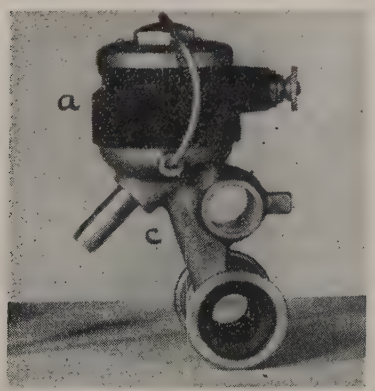

Fig. 20.—The assembled magnetic pulsator.

This type of pulsator valve is essentially a "relay" which "amplifies," as it were, the impulses from the impulse-maker at the pump, giving snappier pulsation than would be obtained with a single master pulsator. Driving mechanism is reduced to a minimum. but unless the valves are washed out and regularly taken to pieces there is a real danger of contamination from milk which has found its way up into the valve from the milk pipe.

Magnetic Pulsators

A magnetic pulsator is shown in Figs. 19, 20, and 21. Fig. 19 shows such a pulsator in pieces. It consists of a hermetically-sealed electric solenoid (a), a valve disc (b), which is of magnetic metal with holes drilled near

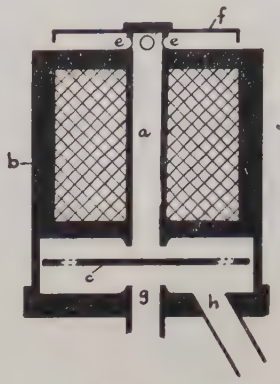

Fig. 21. — Diagram showing the action of a magnetic pulsator.

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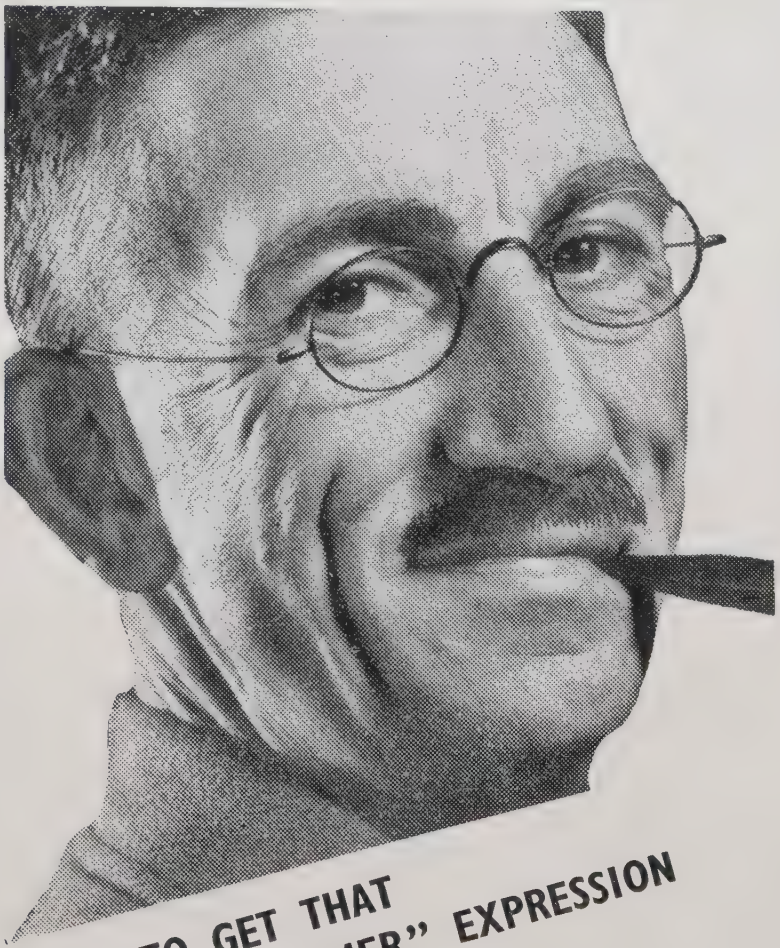

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its periphery, and the main valve casting (c). The assembled valve is shown in Fig. 20. Fig. 21 is an explanatory diagram showing the action of the device. The metal tube (a) extending down the centre of the solenoid (b) protrudes slightly to make a seat for the valve disc (c). The upper end of this tube, which functions as the core of the solenoid, opens through the ports (e) under the cover (f) and thence to the air. Below the disc is a protuberance (g), through the centre of which passes a hole connecting to the vacuum pipe. This protuberance functions as a valve seat for the disc (c). At (h) is a tube for connection to the claw down-dropper. The solenoid is supplied with electric current via a terminal (see Figs. 19 and 20), the return lead being "earthed" to the casting so that the current returns via the piping of the machine. A small direct current generator driven from the vacuum pump supplies the energising current, which is controlled by a switch mechanism also driven from the vacuum pump. The current to the pulsators is thus turned on and off regularly, producing the required pulsator ratio.

The action of the device is as follows:—When current flows in the coils of the solenoid the valve disc (c) is attracted towards it, closing the hole through the centre of the core and opening (g) to the vacuum. In this way the claw lead (h) is connected to the vacuum, giving the release phase. As soon as the current stops flowing atmospheric pressure acting on the upper surface of the disc (c) causes it to move rapidly downwards, closing the lower seat (g) and opening the upper seat at the end of (a). Air can now flow in through (a) through the holes in the valve disc and into the claw lead (h), thus producing the squeeze phase.

The whole device is held together by a spring clip, and is therefore very easily taken to pieces. There are no moving mechanical parts in the drive of this type of pulsator, so that there need be no such parts in the bails. As the valve requires no lubrication and can be easily cleaned, it is one of the most hygienic valves available. The reliability of the switching mechanism has been questioned, but as the switch employs platinum contacts of the type used in motor-car distributor mechanisms, there should be no trouble due to faulty contacts.

Having discussed the main types of pulsator valve, we must now turn to an examination of the effects of certain general features of milking

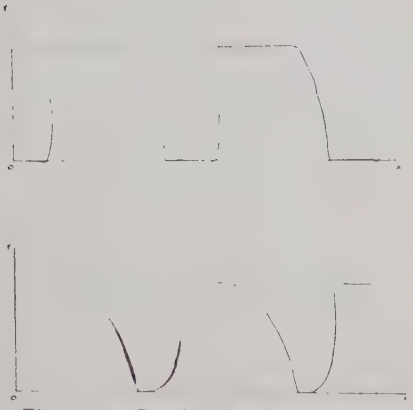

Fig. 22.—Graphs showing the decreasing pulsations as the distance from the valve increases.

machines which change the action of the pulsator regardless of type.

Position of Pulsator Valve

We have previously mentioned one reason for using individual pulsators, namely, that they give a "snappier" action than the "master" type. The importance of this point becomes evident when the master pulsator is situated at the end of a long shed. As we go away from the valve the pulsations become more and more feeble. This is illustrated in the graphs shown in Fig. 22 (a and b). The graph (a) shows a recording taken near the valve while (b) was taken some distance away. The effect is quite marked. When the pulsator is some distance from the cups the size of the piping has an important effect on the action at the cups. With small piping (which has a small volume) we get a rapid release, but a slow squeeze (due to the resistance offered by the pipe to air flowing in). On the other hand, large piping gives a slow release, due to the volume of air to be displaced, but a rapid squeeze. The nearer the valve is to the claw the smaller the volume to be displaced and the lower the resistance offered to air flow. Hence, both squeeze and release phases are made "snappier."

Size of Claw Nipples and Pipes

To ensure effective pulsator action the claw nipples and pipes must be of reasonable dimensions. Fortunately, this is realised by most modern manufacturers. There have been several types of claw on the market employing a small pulsator pipe and nipples. These definitely hinder the pulsator action. An individual pulsator with such a claw may be worse than an old master pulsator with a good claw.

"Dual Vacuums" and "Vacuum Breaks"

The characteristic of a "dual vacuum" milking machine is the use of a higher pulsator vacuum than that obtaining in the milk pipe. The effect of this is illustrated in Fig. 23. The squeeze position is normal, as in Fig. 2, while in the release position (Fig. 23) the higher pulsator vacuum causes the inflation to bulge. It is possible that this may give a slightly more marked action to the pulsator, although when several variations of the dual vacuum arrangement were tried out at Wallaceville no important differences were observed. Such an arrangement tends to wear the inflations more rapidly than the single vacuum system, and they require more frequent tightening.

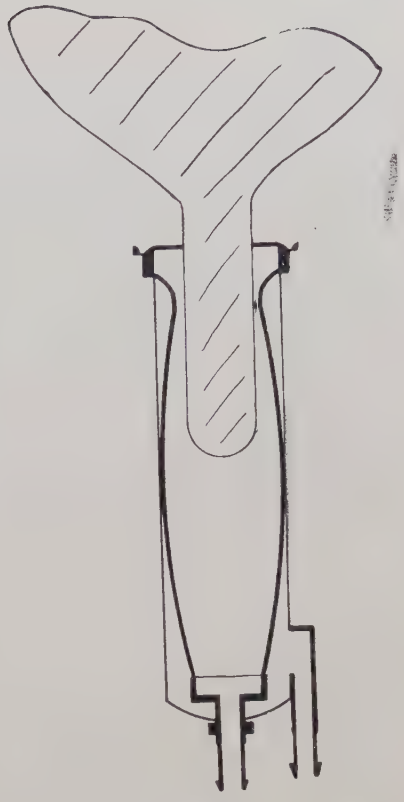

Fig. 23.—The effect of a "dual vacuum" milking machine.

The "vacuum break" has a similar though less marked, effect to the "dual

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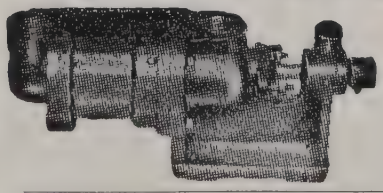

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vacuum," provided the "break" occurs on the release phase. The drop in vacuum in the milk pipe due to the action of the "break" causes the inflation to bulge slightly. However, the effect is not sufficiently marked to increase the wear on the inflations.

Before leaving this section it is important to note that any vacuum-reducing device placed between the main milk pipe and the claw produces the same effect as the "dual vacuum" system. Such an arrangement is, in effect, a local "dual vacuum" mechanism in each bail.

Releaser Pulsators

With the exception of the magnetic pulsator described, releaser pulsators are normally identical with those used in the bails. It is common practice to drive the releaser pulsator at a lower speed than the bail pulsators, and many ingenious devices are in use for this purpose. The main point to be watched when fitting the releaser pulsator is to place it as near as possible to the releaser. This reduces the length of connecting tube—a tube which, more than any other part of the machine, is likely to become contaminated, and which is frequently neglected during the cleaning operations.

General Considerations

The following points should be watched in connection with all mechanical pulsators.

Remember that the pulsator valve is subjected to a large force due to atmospheric pressure acting so as to press the slide firmly against the valve face. This force causes wear and much friction unless the valve is well lubricated. A few drops of oil once a week will reduce wear and the power required to drive the mechanism.

Keep the valves clean. Grit causes uneven wear, which produces grooves in the slide and face. When this happens the valve leaks and power is lost. Once a month wipe the valve faces clean with an oily rag. Enclosed pulsators are normally not susceptible to dust and dirt.

Keep all moving parts on the driving mechanism oiled, and make sure that all driving collars, set screws, etc., are kept tightened. Any slackness in the driving gear will cause abnormal pulsator ratios and feeble pulsation.

Pulsator speeds between 40 and 44 pulsations per minute seem to be most satisfactory. Where belt drives which may slip are used, or where the pulsator may vary in speed due to any other cause, check the pulsator speed occasionally. If it is suspected that the ratio may have altered it is best to have the valves reset by an experienced mechanic. When valves have become noticeably worn have them reground as soon as possible. Badly-worn valves may have to be replaced.

Remember that faulty pulsator action on an otherwise good machine may cause intolerable slowing up of the milking process and abnormal amounts of "strippings."

Acknowledgments

The writer is indebted to Messrs. J. B. McEwan and Company, Ltd., and Messrs. Alpha-Laval Separator Company, Ltd., for the loan of machinery used in the preparation of illustrations, and to Mr. A. L. Bryant for the preparation of the photographic illustrations accompanying this article.

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PRODUCTION OF RYEGRASS AND WHITE CLOVER SEED UNDER IRRIGATION

By
G. G. CALDER,
Instructor in Agriculture,
Alexandra.

A paddock of white clover and ryegrass grown for seed production.

IN the general management of grass and clover paddocks for the production of feed or hay an attempt is made to produce the maximum volume of grass and clover possible. To this end, fields under irrigation are watered approximately every fortnight during a dry period, depending on the type of soil present, to maintain a good vigorous growth.

For seed production, however, the position is practically reversed. Although the grass and clover require sufficient moisture to keep healthy, a large bulk of foliage and stem is not required; in fact, it is a disadvantage. If a liberal irrigation is carried on throughout the season a rank growth of ryegrass is obtained which is very liable to lodge. Cutting is difficult, there is more bulk of material to handle, and a reduced amount of seed is produced.

Probably the greatest risk in ryegrass seed production is in making up one's mind when to close the paddock up from stock. If the paddock is closed up early in the spring and there is a good growing season, the chances are that the crop will lodge. If it is closed up at the end of October and a dry summer follows, there is very little growth. Under irrigation, this gamble on the future climatic conditions can be eliminated. The paddock should be grazed periodically with large numbers of sheep rather than grazed steadily with a smaller number until about late October, when the paddock is closed up. At this period the area should be uniformly well grazed, otherwise topping with the mower may be desirable.

A thorough irrigation, which will probably carry the crop on until it is in or past the flowering stage, should be given, and if fair rain has been experienced no more irrigation may be necessary until after the crop has been harvested. If, however, conditions are dry following flowering, a quick, light flush of water may be necessary to finish development of the seed.

This second irrigation requires some experience as to whether or not it should be applied. If in doubt—don't put the water on. The harder the conditions—within reason of course—the more the plants appear to put all their energy into reproducing their kind, and the best samples of seed are obtained under these conditions.

When conditions are not severe, part of the plant's energy goes into seed production, and the remainder into foliage. Thus, the seed sample suffers.

Generally speaking, after the first two or three crops of ryegrass seed under irrigation, the white clover begins to dominate the sward, especially if the area has been topdressed with superphosphate, lime, or both. As white clover is usually a more payable crop, one will probably in the third or subsequent years concentrate on the production of white clover seed, at the same time harvesting a small amount of ryegrass.

Ripening Periods

In the ripening periods of ryegrass and white clover there is a difference of about a fortnight or so. The ryegrass is the first to ripen. Frequently, it is difficult to decide which crop to take as the main one. If the ryegrass is harvested when it is at its best, an appreciable amount of white clover is also obtained. If one waits for the maximum amount of white clover, a high percentage of the ryegrass has shaken but a small amount is usually still obtained.

For white clover seed the position is similar to that of ryegrass, although a little more water may be required to keep the crop healthy for the slight-

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ly longer season. Less water and at longer intervals between waterings is necessary if the area is used for seed production and not for grazing. Although white clover does not lodge under generous irrigation, much of the plant's energy goes into leaf and stem production, which overgrows the earlier flowers and causes the flowering to be sparse and drawn out over a long period.

With the application of less water the energy of the plant is concentrated mainly on production of flower heads, and one obtains a more even and quicker growth of flowers, giving a snow-covered appearance to the paddock. The aim should be an even, steady growth of flowers and not a bulky crop of foliage with flowering drawn out over the whole season.

Time of Watering

The question of how much and how often to water is mainly one of experience. A good irrigation at time of closing up the paddock may be all that is required if some good rains are obtained during the summer. If the area is irrigated, a quick flush of water is the ideal as against a steady thorough soaking of the soil. If there is any doubt as to whether one should irrigate or not, don't do it, or at least put it off a while; otherwise a vigorous new growth will check flowering.

In districts where irrigation is practised, one can usually depend on a hot, dry summer, and under these conditions header-harvesters are becoming increasingly popular. The crop is mown and left for, say, ten days, and is then picked up and threshed with a header-harvester with pick-up attachment. This method of harvesting saves labour, and practically all the seed is saved. With no handling of the crop, such as carting and stacking, there is no loss of seed.

After threshing, the straw or rough hay (from white clover) is removed, the paddock irrigated, and good, clean feed quickly comes away.

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Slaughterings of Stock

THE following returns of slaughterings of stock at meat-export slaughterhouses and abattoirs for the six months May-October, 1941, have been compiled by the Livestock Division:—

District	Cattle	Calves	Sheep	Of which Ewes were	Lambs	Swine
North Island.						
Meat Export Slaughterhouses—						
Auckland	85,642	527,491	48,411	17,824	141,487	110,236
Poverty Bay-Hawke's Bay	30,385	51,111	38,110	5,533	218,687	10,294
Taranaki-Manawatu	40,641	200,081	10,783	1,534	144,705	47,468
Wairarapa-Wellington	23,778	22,982	26,611	6,174	129,467	8,585
Totals	180,446	801,665	123,918	31,065	634,346	176,583
Abattoirs	62,430	21,611	264,568	133,773	25,848	58,473
North Island Totals	242,876	823,276	388,486	164,838	660,194	235,056
South Island.						
Meat Export Slaughterhouses—						
Nelson-Marlborough	692	10,517	11,220	5,942	70,906	4,054
Canterbury	5,792	33,268	166,859	130,105	388,644	13,429
Otago-Southland	3,898	38,506	140,128	129,785	467,303	3,289
Totals	10,382	82,291	318,207	265,832	926,853	20,772
Abattoirs	28,042	6,532	136,515	74,515	12,718	22,391
South Island Totals	38,424	88,823	454,722	340,347	939,571	43,163
Dominion.						
Meat-expt. Slaughterhouses	190,828	883,956	442,125	296,897	1,561,199	197,355
Abattoirs	90,472	28,143	401,083	208,288	38,566	80,864
Grand Totals	281,300	912,099	843,208	505,185	1,599,765	278,219
In addition the following stock was slaughtered at Rural Slaughterhouses during the six months ended 30th Sept., 1941	35,489	885	110,908	Unknown	4,991	14,276
Same Periods, 1940—						
Meat Export Slaughterhouses and Abattoirs	321,893	922,467	1,087,023	674,318	1,448,447	252,934
Rural Slaughterhouses	38,010	986	115,275	—	4,026	13,343
Same Periods, 1939—						
Meat Export Slaughterhouses and Abattoirs	264,605	909,971	827,526	434,603	1,504,878	185,314
Rural Slaughterhouses	44,240	1,292	107,144	—	3,807	14,079

Slaughterings of Pigs

The 59,050 pigs slaughtered in meat-export slaughterhouses and abattoirs during October were distributed in weight ranges approximately as follows:—

Up to 60 lb.	689
61-120 lb.	24,453
121-160 lb.	27,205
161-180 lb.	1,640
Over 180 lb.	1,816
Sundries	3,247
	59,050

The grading of porkers is 88 per cent. of first quality and 12 per cent. of second quality, and the grading of baconers is 82 per cent. of prime 1's, 14 per cent. of prime 2's, and 4 per cent. of second quality.

In the different weight ranges of baconers the grading is as follows:—

121-160 lb. .. 82%, 14%, 4% of P1, P2 and 2nds respectively.
161-180 lb. .. 78%, 16%, 6% of P1, P2 and 2nds respectively.

TOPDRESSING IN THE AUCKLAND PROVINCE

Review of Field Experiments In Western Bay of Plenty

By

A. V. ALLO,

Instructor in Agriculture, Tauranga.

PROBABLY no district in New Zealand shows such a rapid and payable response to topdressing as the Bay of Plenty, and it can truthfully be said of this district that it is impossible to farm successfully without an annual application of fertilisers. In general, this is well recognised by farmers throughout the district, and it is a question of what are the most suitable fertilisers to use, rather than whether one should topdress.

During the past few years the Fields Division has endeavoured to find the answer to this question by laying down an extensive series of topdressing trials covering the main soil types of the Bay. As a result an answer can now be given with a greater degree of certainty than ever before.

Soil Types

There are five main soil types in the Western Bay of Plenty, each containing several minor variations.

(1) Leached pumiceous sandy loams, typical of the Waihi Plains. This is a fairly mature pumice soil, which has been subject to leaching under conditions of high rainfall.

(2) Free pumiceous sandy loams of the Katikati hill country. This soil type is also found on the hill country in the Waihi district, and extends to the Whakamarama district. The soil is newer than that of the Waihi Plains, and leaching has not been so extensive.

(3) Free coastal soils extending from Waihi Beach and Athenree to Kairua. This consists of pumice loam, with a black top soil of varying depth.

(4) Free sandy pumice soils in the Tauranga and Te Puke districts, extending from Whakamarama to Pongakawa and Otamarakau.

(5) Peaty loam soils typical of swamp country in the Te Puke and Maketu districts.

(1) Leached Pumiceous Sandy Loam

The leached soils of the Waihi Plains have a low natural fertility, and it was not until the introduction of topdressing into the district that these soils began to come into production. They are particularly deficient in phosphates and potash, and these two fertilisers are essential if full pasture production is desired.

All types of phosphate respond on this soil, but in nearly every case superphosphate slightly overshadows any other form of phosphate. This is particularly so on impoverished pastures.

For many years phosphates alone were used, but lately it has been demonstrated that applications of potash as well as phosphates are essential for full production on this country. Lime seldom gives any noticeable response, especially on younger pastures, but on older swards a slight response is sometimes seen.

Results of trials on this soil type are seen in Table 1, and recommendations are 3 to 4 cwt. of phosphate and 1 cwt of 30 per cent. potash salts per acre yearly, plus, on older pastures, an occasional dressing of 5 cwt. of lime per acre after adequate phosphates and potash have been applied.

(2) Free Pumiceous Sandy Loam

The whole of this soil type, which is found in the Katikati hill country,

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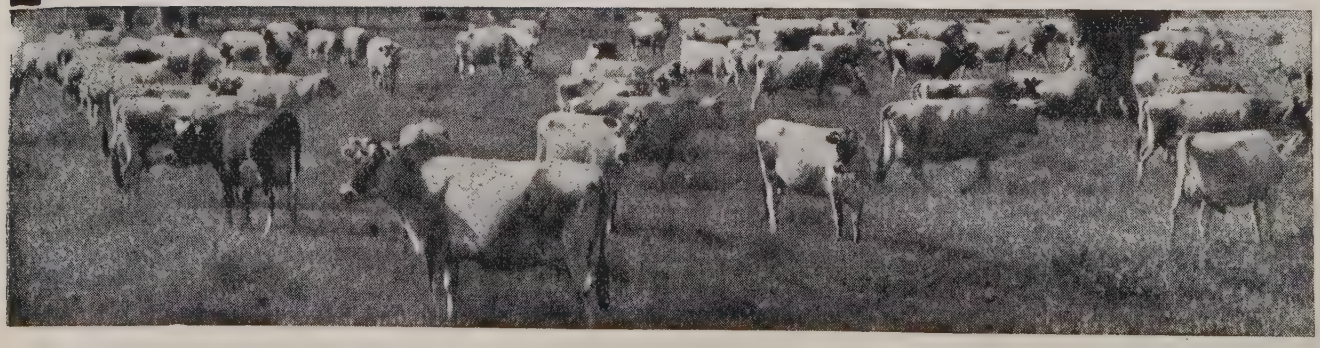

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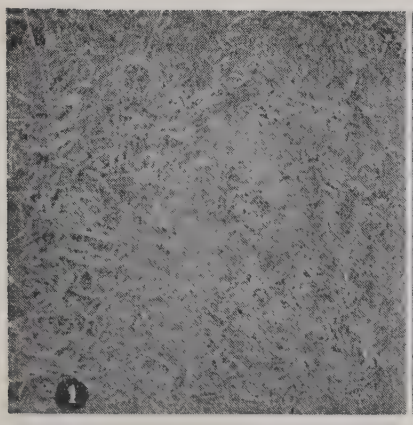

Fig. 1.—Light pumice country which has received no manure.

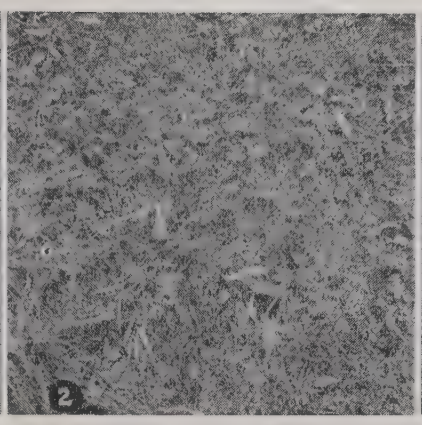

Fig. 2.—The same pasture as in Fig. 1 one year after its first topdressing with superphosphate. Note the entry of clovers into the sward.

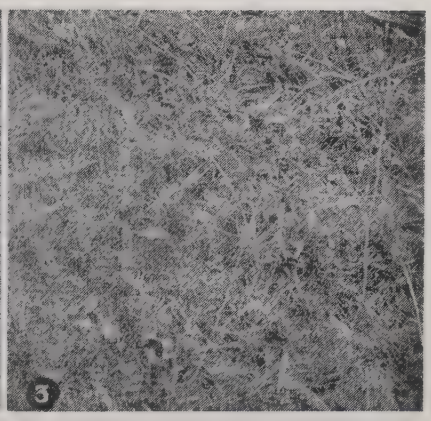

Fig. 3.—Land on the Waihi Plains which received no manure. Note the weeds and the lack of clovers.

TABLE 1.

Farmer.	Address.	Differences from No-manure.		
		Super.	Potash.	Super and Potash.
J. C. Gordon ..	Tauranga Road	Good	Slight	Very Good
J. N. Hooker ..	Beach Road	Fair	Fair	Very Good
Mrs. Irvine ..	Frankton Road	Fair	Fair	Excellent

is phosphate-deficient, and numerous topdressing trials have proved quite conclusively that superphosphate will give better results than any other form of phosphate. It is not intended to suggest that basic slag or similar types of fertilisers are useless, but, rather to stress that, whether required for the rapid renovation of an old sward, for quick establishment of a new pasture, or for general maintenance of production, superphosphate stands pre-eminent in the phosphate group.

This country has also given an indication of a potash response, although it is evident that the need for potash is nowhere near as urgent as it is on the Waihi Plains. However, it is considered that when farming conditions return to normal after the war it would be profitable to apply potash to this country. It must, however, be stressed that potash by itself would be useless, and must be applied in conjunction with adequate phosphates.

Opinions differ widely as to the value of lime on this country. At one time it was commonly stated that lime was not necessary, but this idea has since been modified, as it now appears that there is a definite place for lime in the topdressing programme. Although experiments have usually given little response in the early stages, limed plots have shown an improvement after about four years in some cases, while occasionally lime responses have shown up in twelve months. Consequently, it is safe to say that on this class of country farmers could, with advantage, apply lime at the rate of 5 to 6 cwt. per acre to their older pastures, but only after adequate phosphates have been applied. Table 2 gives responses from representative trials on this soil type.

TABLE 2.

Farmer.	District.	Differences from No-manure.				
		Super.	Potash.	Sup. & Pot.	Lime & Sup.	Lime, Sup., and Pot.
P. Brake ..	Athenree	V. Fair	Slight	V. Good	V. Fair	V. Good
K. K. Sutton	Woodlands	Good	Nil	V. Good	Good	V. Good
A. W. T. Hyde	Katikati	Slight	Slight	V. Good	Slight	V. Good

(3) Free Coastal Soils

This soil type (the Waihi Beach type) is rather similar to type 2, except that there is a distinct black topsoil of varying depth. The country is on a lower level than type 2, and is undulating to rolling.

Responses to phosphate and lime are as for type 2. The response to potash is far less definite, showing up in only a very small proportion of trials, and then only to a slight extent. It is doubtful whether application of this fertiliser would be payable. Table 3 gives responses obtained in trials on this soil type.

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(4) Free Sandy Pumice Soils

In general this soil type (Tauranga and Te Puke hill country) is rather similar to type 2, but the ash deposit is of more recent origin, and there is a lower rainfall than in the Katikati hill districts.

Responses to lime and phosphates are as for type 2, while potash responses are not general. In the Omanawa district there are indications of a potash response, although this showed up only after the trial had been down a number of years. Here the main response is to phosphate, and only after several years did the effect of the potash dressing become marked. Nevertheless, in this area potash is a definite requirement, and should well repay the cost of application once farming conditions return to normal. Slight potash responses have also been obtained in the Tauranga district. Table 4 gives responses obtained in typical trials on this soil type.

(5) Peaty Loam Soils

The extensive areas of low-lying swamp country in the Te Puke,

TABLE 3.

Farmer.	District.	Differences from No-manure.				
		Super.	Potash.	Sup. & Pot.	Lime & Sup.	Lime, Sup., and Pot.
Athenree Land Company ..	Athenree	Good	Nil	Good	Good	Good
D. Thomas ..	Katikati	Good	Nil	Good	Good	Good
H. Emeny ..	Omokoroa	Good	Nil	Good	Good	Good
C. Sargent ..	Te Puna	Good	Trace	V. Good	Good	V. Good

TABLE 4.

Farmer.	Address.	Differences from No-manure.				
		Super.	Potash.	Sup. & Pot.	Lime & Sup.	Lime, Sup., and Pot.
C. Rowlandson	Waimapu	V. Good	Nil	V. Good	V. Good	Excellent
L. P. Jensen	Omanawa	V. Fair	Slight	V. Good	V. Good	Excellent
D. S. Ross ..	Te Puke	Fair	Nil	Fair	Good	Good

TABLE 5.

Farmer.	Address.	Differences from No-manure.				
		Super.	Potash.	Sup. & Pot.	Lime & Sup.	Lime, Sup., and Pot.
R. Wilson ..	Papamoa	Fair	Slight	V. Good	Fair	V. Good

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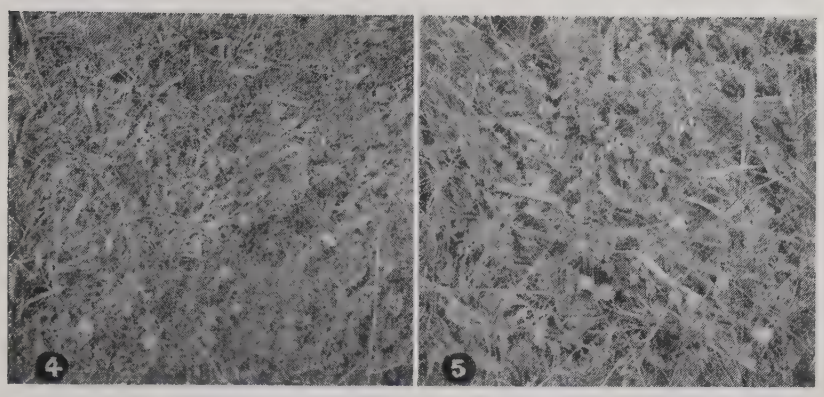

Fig. 4.—Land on the Waihi Plains which was topdressed with superphosphate. Note the slight clover improvement.

Fig. 5.—Superphosphate and potash were applied to this land on the Waihi Plains. Note the marked clover response, which is far better than with superphosphate alone.

Maketu, Papamoa, and Paengaroa districts are of a peaty loam soil type, of good quality, and carry good pasture when drained.

As is the case with the other soil types discussed, this country is very responsive to phosphates of any type, but with superphosphate again pre-eminently suitable. Past experimental work has indicated that, in addition to phosphates, some improvement is given by the use of lime and potash. More recent experimental work on a very restricted scale serves to emphasise the value of potash when associated with phosphates, but insufficient time has elapsed to permit of any deductions concerning the effect of lime.

Altogether, the extent of experimental work on this soil type has been rather too meagre to make any definite pronouncement, but there are reliable indications that in all probability lime and potash would be useful adjuncts to phosphates. Hence, on this country, one would recommend annual dressings of phosphates at 3 to 4 cwt. per acre, plus ½ to 1 cwt. of 30 per cent. potash salts. An initial dressing of lime of up to 10 cwt. per acre might also be followed by dressings of 5 cwt. per acre every two or three years.

Conclusion

It is obvious that phosphates are essential on all soil types in the Western Bay of Plenty, and the annual dressing should be at least 3 cwt. per acre. On potash-responsive soils an annual dressing of 1 cwt. 30 per cent. potash salts could be applied with advantage. A dressing of 5 to 6 cwt. of lime would give beneficial results on a few of the older pastures on most farms on all soil types.

Finally, the Fields Division acknowledges with thanks the co-operation of farmers on whose properties various types of topdressing trials have been conducted.

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Preservation of Calico And Hessian Cloth When Exposed to the Weather

— By —
WM. C. HYDE, Horticulturist, Wellington.

THE present cost of calico and hessian cloth has led to some inquiry from market gardeners, nurserymen, farmers, and others regarding preservative treatment which will substantially lengthen the useful life of stack-covers, shade-blinds, tents, etc., when exposed to the weather. In such circumstances, cloth of this kind is subject to the attack of parasitic fungi, chiefly *Cladosporum herbarum*, which are the primary cause of deterioration.

The Public Works Department, in co-operation with the Plant Research Bureau, has carried out experiments in preservative dressings for tent calico. Composite tent flies were erected in the Waipoua forest for two years and then examined. They were composed of strips which received the following dressings:—

Iron Chromium No. 1.
Iron Chromium No. 2.
Shirlan W.S.
Hoyle's Dressing.
Aluminium acetate No. 1.
Aluminium acetate No. 2.

Both chromium treatments completely prevented the appearance of moulds; No. 1 gives the cloth a brown colour, which considerably interferes with light transmission; No. 2 a green colour, which is not so opaque. The cost was about 19s 6d per tent. The treatment requires special apparatus and technical supervision, and it can be applied to calico only before making up.

Treated with Shirlan W.S., the calico cloth showed only a trace of black-spot at the end of a year's exposure in camps where mould was particularly severe and untreated cloth was heavily infected in three to four months. The cost per tent was 4s to 9s 6d, depending on the number treated.

Treatment with Shirlan W.S. consists in soaking the tent, complete with ropes, for one hour in a solution of 1½ ounces of Shirlan W.S. to each gallon of water. The tent must be covered with the solution, loosely folded, and moved about during the dip so that every part becomes evenly saturated. The solution will not injure the tub or the hands of the operator.

After removal, and without wringing, the cloth is hung out to dry, and every effort should be made to allow all parts to dry evenly. When thoroughly dry, the tent may be closely folded and stored until required. The treatment imparts a cream colour to the fabric, and does not affect inflammability, light transmission, or waterproofing.

The remaining treatments listed did not compare favourably in any respect with those mentioned, except that they were slightly cheaper than "iron chromium."

A cheap and simple method of protecting jute and cotton sandbags against rotting has been developed by the Imperial Chemical Industries. It is estimated to increase the service life of the bags at least eight times at a cost not exceeding 1-10th. of a penny per bag. A Burgundy mixture is prepared by slowly stirring 11½lb. of washing soda, dissolved in 5 gallons of water, into a solution of 10lb. of bluestone in 30 gallons of water (using a wooden, not iron, vessel). The quantity is then made up to 40 gallons.

The bags are then immersed until thorough saturation is effected. After the removal of excess liquor by wringing, the bags should weigh twice their original weight. They are dried at low temperature. The period of immersion in cold water should not be less than five minutes, but the process may be expedited by warming the water to 88deg. to 100deg. F. Samples of treated fabrics buried in garden soil for eight months were found in excellent condition. The "control" fabrics were almost entirely disintegrated.

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Should Milking Cows Be Permitted To Drop Condition in Winter?

By C. WALKER,
Instructor in Agriculture,
Thames.

IN discussing the feeding of dairy cattle with farmers the claim is occasionally advanced that dairy cows should be permitted to fall in condition during winter months. In support of this theory it is stated:—

(1) That good feeding designed to bring the animals through the winter in good condition induces a continuation of flesh production during the ensuing lactation period rather than the production of butterfat, and

(2) that Nature has made provision for leanness during the winter period, and that any effort to alter that provision will have ill-effects upon the stock.

Before discussing winter feeding itself, let us examine these two contentions.

First Theory

Taking (1), it is generally agreed and understood that our modern, high-producing cow is a product of evolutionary breeding measures spread over centuries of livestock study. In the beginning, a dairy cow as we know her today did not exist, but instead, there was a type of beast which yielded moderate quantities of milk solely for the nourishment of her offspring. Once that purpose had been fulfilled she could devote the rest of the year to building flesh which would carry her through the lean winter period.

Man, however, in his desire to exploit the bovine species for his own benefit, began breeding to certain types for specific purposes. Thus we have evolved a type as represented by the Jersey, Ayrshire, and Friesian, which is characterised by its great capacity for milk production, and another type represented by the Hereford and Polled Angus, which has unrivalled ability to produce flesh. This breeding has continued for centuries, with rigorous culling within breeds for improvement of type.

Surely, then, it is unreasonable to expect a liberal winter feeding of a Jersey to destroy all the work of generations of breeders and change that animal into a beef type. Would it not be just as reasonable to expect the starving of a Hereford cow to convert her into a first-class dairy animal? Such a suggestion would quite rightly be ridiculed by the average intelligent dairy farmer, but I do suggest that it is no more ridiculous than is the claim that liberal feeding of a good dairy

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type would convert her into an animal predisposed to beef production.

Second Theory

Now let us consider the claim that leanness is a provision of Nature. With this contention I do not agree. Nature did not intend that a cow should be milked for ten months in every year. Under natural conditions the mothering of the calf would be completed in four or five months, after which the cow could build up against a winter shortage. Consequently, she had much better prospects of coming through the winter in good condition than has the modern dairy cow.

Just as Man has exploited the dairy cow for his own gain and to her detriment, so, to this extent, it is incumbent upon him to take the necessary steps to provide for her welfare. It will be obvious that an animal which produces for a full ten months in every twelve has little opportunity of replenishing the wear that such production exerts on her body. Consequently, she must be well fed, particularly in the winter when supplies are low, if she is to enter the following season in a condition that will enable her to continue on a high level of production. Over-feeding during the winter is most unlikely to occur; unfortunately, the reverse is far too common.

What are the requirements of a dairy cow for maintenance during the normal winter period? Experimental work suggests that the average beast requires 22lb of dry matter per day. The sources of such rations will be pasturage, hay and ensilage reserves, concentrates, and farm-grown crops. Generally speaking, the capacity of pastures will be limited to from 5lb to 10lb of dry matter per acre per day during this period. Consequently, the balance of the ration will have to come from concentrates or farm-produced supplements. Because of the cost of the former and the relative cheapness of the latter, most farmers should aim at greater production of hay, ensilage, and root crops.

Need for More Hay

Where hay alone is relied upon, at least 15cwt per cow should be aimed at. This in itself will be the minimum requirement, and it would certainly be safer to increase this to a ton per cow. Statistics show that the average hay production per cow is in the vicinity of 5cwt, and when it is realised that much of this is of low quality, the need for much greater provision will be readily appreciated.

Where part of the reserve is saved as ensilage, the quantity to be so saved can be assessed on the basis of one ton of good hay being equivalent in feeding value to three tons of good ensilage.

The reserves of hay and silage may be further augmented by the growing of winter cereals or roots. The wise farmer will not reduce his hay when he begins cropping; rather will he re-

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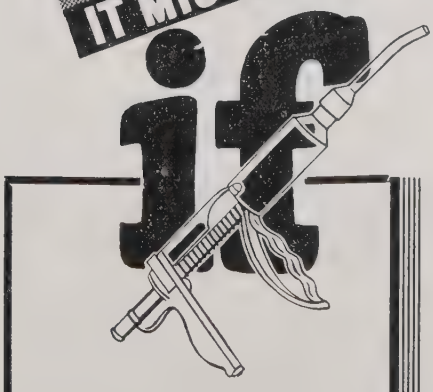

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gard such cropping as a further safeguard against winter shortages. A reserve, as indicated, provides sound security against unexpected demands. It must be regarded as the minimum for safety.

Certainly, some farmers carry on in normal seasons with 5 to 10 cwt of hay per cow, but no farmer can justify an outlook that provides for normal shortages only. Sooner or later he will experience an abnormally adverse season, with disastrous results to stock and his financial position if his reserves are in short supply.

A further point to remember is that surplus supplies of stock food can always be put to good purpose. Hay and ensilage can be carried over, hay or roots may be sold, or further stock may be bought in under favourable market conditions.

Farmers might therefore study the position carefully. We are asked to increase cheese production as a war effort, and much of our success in this direction will depend on how to feed our stock.

Student Labour for Seasonal Work

A SCHEME for the placement of schoolboys and university students in ordinary as well as purely seasonal farm jobs is being undertaken this season by the State Placement Service, according to a statement issued by the service. This will come as good news to the many farmers throughout the country who are handicapped by insufficient labour to carry out satisfactorily routine farm duties, and who look forward apprehensively to the approach of the cropping and harvesting season.

How the Scheme Works

Placement officers and the secretaries of Government Youth Centres (juvenile vocational guidance and employment offices located in the four main centres) are already well ahead with the work of compiling a register of schoolboys and university students who will become available for farm work from the middle of December onwards in the cases of schoolboys and from early November onwards in the cases of university students. Schools are being visited by placement officers and Youth Centre secretaries, and the boys are being addressed on the subject of vacational farm work.

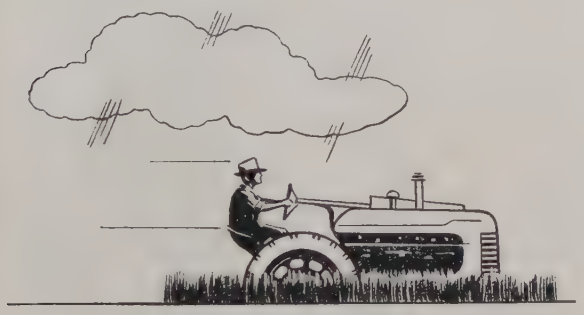
Placement officers report that widespread enthusiasm to assist the Dominion in its war effort is evinced among schoolboys, and as far as university students are concerned, the Student Association executives at each of the university colleges have done good work in enrolling interested students and sending the enrolment forms on to placement officers.

Farmers wanting the services of either schoolboy or university students should communicate with their nearest placement officer, who will take details of the work offering, starting dates, etc, and then refer labour that may be available to the vacancy or vacancies. Placement officers will also co-operate with students and farmers in advancing recoverable fares to students going forward to farm positions.

Should Be Valuable This Season

The Controller of Employment is of the opinion that the plan to take advantage of university student and schoolboy labour should prove much more valuable to farmers this season than it did last when it was also operated—at least in part.

(*Continued on page* 510.)



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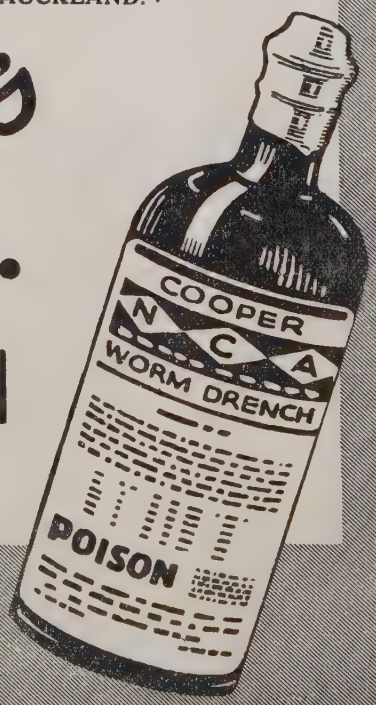

Veterinary Notes for the Farmer

Guard Against Blowfly Strike In Sheep

Contributed by the
LIVESTOCK DIVISION

BLOWFLY strike periodically becomes an acute problem to the sheepfarmer, particularly on the higher country. At the present time sheepfarmers in Hawke's Bay, Marlborough, and especially in the Wairarapa districts should periodically examine the lambs to detect recently struck animals. The recent rains will have stimulated a growth of feed, and the general tendency will be towards a looseness of the bowels, if not actual scouring. Any staining of the wool of the crutch, whether from urine or scour, is liable to be struck when the flies are active. Urine staining of the wool and skin, together with the breakdown products on the surface of the skin, attracts the egg-laying fly. In muggy weather the warmth and moisture necessary for the hatching of the eggs and the growth and development of the maggots are most suitable, so that the strike of individual animals soon becomes apparent.

Investigation has shown that sheep of the Merino and half-bred flocks, because of the wrinkling and folds of the skin, are more liable to staining and more susceptible to strike, and that the plain-bodied sheep are less susceptible. However, when it is considered that a single fly may lay 1000 to 1200 eggs, and that several generations may develop in one summer, it will be seen how important it is for all owners of sheep, irrespective of breed, to adopt all measures possible to prevent susceptible animals from becoming "blown" or "struck."

In New Zealand the flies responsible for strike are the yellow-brown, hairy species and, less commonly, the bronze-green species. The blue bottles and the striped field flies do not blow living sheep, but confine their activities to dead animals. On the other hand, the striking flies may propagate readily on dead carcasses in the absence of suitable live animals. This brings out the fundamental importance of the deep burial or burning of all such carcasses. It would appear more important to prevent the breeding of the fly than to set traps or adopt other methods of destruction if breeding remains uncontrolled. As it is not possible to find every carcass for burial or burning, especially when dead rabbits, hares, birds, etc., provide suitable breeding grounds, some other methods of attack aiming at prevention have been given consideration and trial.

Prevention

Probably the most important line of prevention is the elimination of the conditions in our sheep which attract the egg-laying fly. To prevent strike on the breech an early crutching of all lambs in late December or early January is necessary, followed by a further re-crutching, dependent upon the weather and feed conditions. Extreme care should be taken not to cause skin injuries during crutching, as even small wounds will attract the fly.

Jetting with calcium arsenite solution has been found a useful preventive in Australia, but crutching is the more suitable procedure in this country. Jetting cannot be combined with crutching, as the possibility of the arsenic being absorbed through crutch wounds is too well known. Jetting is carried out in Australia after all wounds have healed, and is considered more economical than a second re-crutching.

All wounds in sheep, including footrot, should be dressed and treated in the usual way to prevent their being "blown" by the fly.

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bably along the fence line or under cover of a tree. A blackish, moist area may be seen on the rump from a distance, but it is necessary to catch and examine all suspected animals at close quarters.

Treatment

Treatment (of the lamb) consists of clipping off the wool around the area where the maggots are operating. It is necessary to see that all maggots are killed and removed, otherwise a few may have escaped and operate in and form a second wound. Boric acid and glycerine, prepared by heating 3 lb. of boric acid in one gallon of pure glycerine, forms a very good, although rather expensive, dressing for fly wounds. It kills the maggots, assists healing of the wound, and tends to prevent a second strike until complete healing has taken place. Cheaper dressings which are effective for destroying the maggots are:—(1) A 5 per cent. solution of zinc sulphate in water, or (2) a 4 per cent. mixture of carbolic crystals in whale oil. Boric acid powder alone may be dusted on. A 2 per cent. solution of liquid carbolic sheep dip or similar disinfectant is effective in driving out maggots, but it is wise to follow up with an oily application, using lubricating or whale oil. Kerosene or bluestone should not be used.

Finally, it may be mentioned that certain paddocks appear to favour the operation of the fly. A change of paddock and moving the sheep into the open, level paddocks and away from cover or steep faces are worth consideration.

STUDENT LABOUR—Continued from page 507.

Last season the scheme was late getting under way, and therefore did not get the publicity among students, and more especially among farmers, that was necessary for its complete success. The result was that although 754 schoolboys volunteered for holiday farm work, farmers employed only 318 of them. Fifty of these boys were placed on sheep farms, 114 on dairy farms, 62 on mixed farms, and 92 on properties where they were performing purely seasonal duties. Thus, there was a reserve of more than 400 schoolboys which farmers did not call upon. Farmers who engaged boys for the Christmas vacation last year were generally warmly appreciative in their comments upon the service given by the boys.

This season, with the scheme in hand much earlier, and also extended to embrace university students, a much larger number of boys and youths should become available. Furthermore, the labour position on farms since last season has under war conditions certainly not become any easier, and if farmers get into touch early with placement officers and give some idea of their needs the scheme should be much more effective this season than was possible last season.

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2

Middle Ear Disease in Pigs

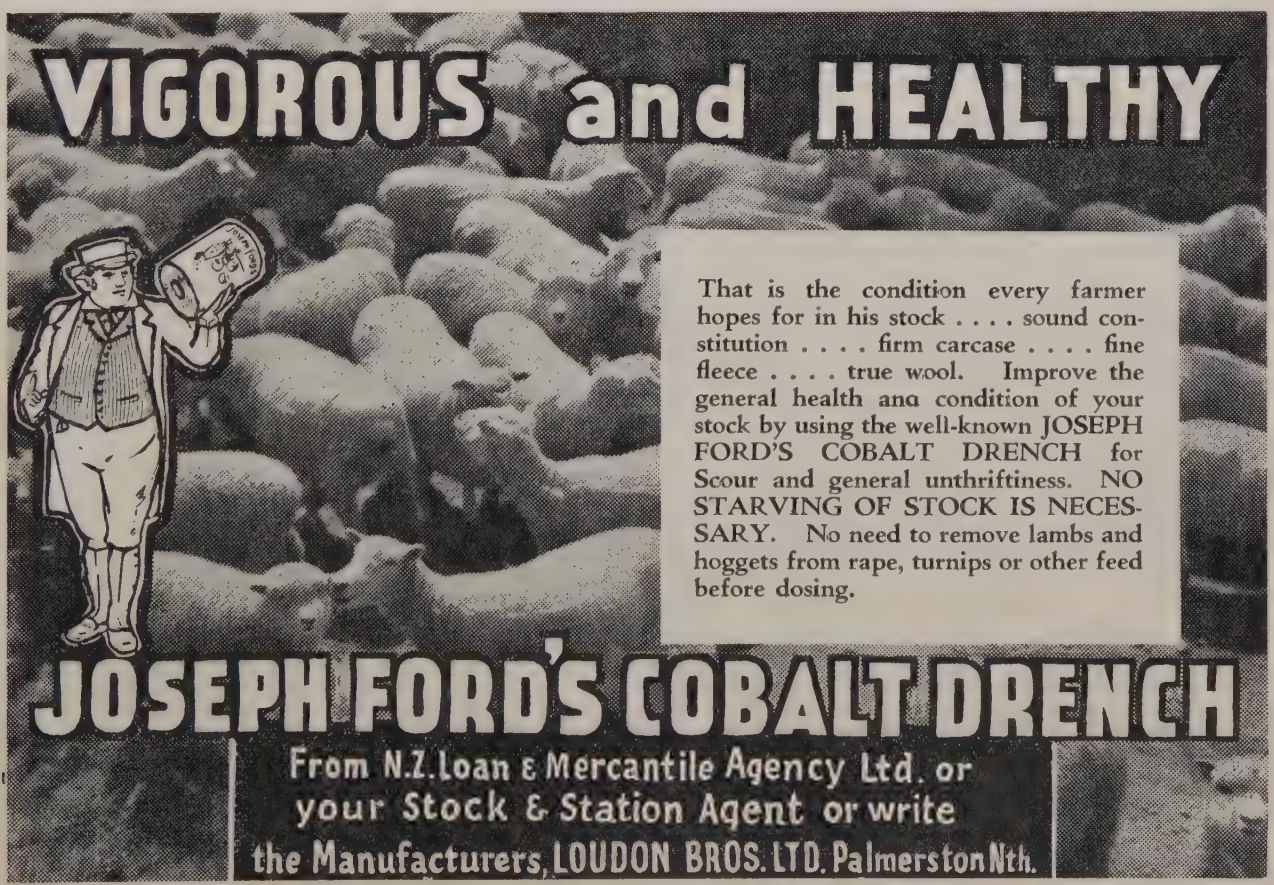
THE accompanying photograph shows a pig in poor condition, which is obviously not doing well. This young pig has lost its baby flesh, has a dry, scaly, harsh skin, an arched back, and has the appearance of an animal not adequately fed and cared for. Young pigs of this age are most susceptible to disease if not properly cared for, and the onset of disease of any nature in such a young animal is not likely to result in economic production.

It will be noted that the pig is holding its head to one side, one ear being elevated, whereas the other is drooping. In short, this pig is affected with middle ear disease. In cases of this type a small abscess forms in the middle ear, and this abscess accounts for the peculiar carriage of the head in affected animals.

The common opinion held by many owners is that this ear disease is caused by the accidental entrance to the ear of skim-milk or whey, which may take place during feeding operations. This view cannot be substantiated, and the general veterinary opinion is that the small abscess forms in the ear in an animal inadequately fed and nourished, or, in other words, suffering from a deficiency of one or more of the essential vitamin elements in the food. The vitamin concerned is most likely to be the fat-soluble vitamin A, which is found in milk fat and other fats, in cod-liver oil, and green vegetable-matter.

To revert again to the photograph, it is evident that this young pig has not been fed in such a way as to ensure maximum growth and health. After weaning, the loss of the fat in the mother's milk and the almost total absence of the fat-soluble vitamins in such feeds as whey, skim-milk, and some of the cereals, together with the fact that such a young animal is not able to eat much green feed, even if this is available, all tend to support the theory of a vitamin deficiency. On the other hand, the disease is not seen in a well-fed pig brought up on a ration containing the necessary amount of protective foods.

The system of creep feeding the young litter, the use of a food rich in fat-soluble vitamin, and the general good care and housing of the young litter after weaning are all involved in the prevention of this disease in young pigs. The disease is one for prevention rather than treatment. If treatment, however, is to be considered,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one must give attention to warm, dry sleeping quarters and an adequate diet. Such a diet should include green feed in an easily digestible form for young pigs, and, if possible, a fish oil rich in the essential vitamin elements.

With the improved position in regard to the standard of pig husbandry in later years, fewer cases of middle ear disease are now seen on farms. With the change-over from skim-milk to whey feeding, it is possible more cases may crop up, and this note is intended to advise pig-owners to be on the look out for the disease.

Answers to Correspondents

Remedy for Cracked Teats

W.H.K. (NEW PLYMOUTH):—

I will be very grateful if you will permit your veterinary expert to suggest a remedy for cracked teats. Several of the older cows in my herd have these cracks, quite like cuts, and generally the teats very rough. They, with the heifers, have almost recovered from the cow pox. I may add that my hands are almost as badly cracked as the cows' teats. I presume the principal cause has been the wet and mud, aggravated in the case of my hands by the washing soda. I may add I always use petroleum jelly when milking, and would wish to add some healing material to this.

I purchased for my hands a pair of india rubber gloves, such as surgeons use, at a cost of 12s. 6d., which lasted just two weeks without splitting in small pieces.

Advisory Service on Veterinary Matters.

Farmers are invited to submit inquiries connected with the health of their stock, and the replies will be published under this heading.

LIVESTOCK DIVISION:—

A suitable ointment would be:—

Prepared calamine, 1 part.

Salicylic acid, ¼ part.

Petroleum jelly, 4 parts.

Lard, 4 parts.

A little of this could be applied to the affected teats after milking.

Surgical rubber gloves are somewhat fragile, and no doubt the action of the petroleum jelly would hasten the process of destruction.

Arthritis in Lambs

"LAMBS" (NORTH AUCKLAND):—

I would be very grateful if in your next issue you could give me some information on an ailment in my lambs which I have been troubled with for the last few years. The farmers in this district refer to it as arthritis, and as yet I have not been able to either ascertain the cause or contact anyone who can submit a remedy.

On my farm, lambs from a week old and up to about 10 weeks are liable

to contract the disease, but it is most prevalent in lambs from about three weeks to a month old. The lambs become stiff in one or more joints, and in most cases swell at the affected joints. It also appears to affect the spine, as the lamb moves about only with difficulty and apparently in much pain. The lamb lies about and doesn't suck its mother sufficiently to keep her in full milk, with the result that in about three to four weeks, when the lamb recovers, if it does so, the mother is then partially dry. The lamb, when disturbed, appears to suffer much pain, and lies down immediately it is left alone. In bad cases, after about a week, its wool starts to drop off, and in some cases it becomes almost bare.

I have been told that it is a germ taken from the tailing yards, but I have proved this to be wrong, as I have tailed in the paddocks with every care in disinfecting, etc. And apart from this, some of my worst cases are before tailing. So far this year, I have already lost quite a few, and those that have been affected take months to recover and seldom make the sheep that they otherwise would do.

LIVESTOCK DIVISION:—

The condition affecting your lambs is known as arthritis, and is caused by organisms of different types which have gained entrance through such wounds as occur at marking time or, previous to that, through the navel or umbilicus. The nature of the arthritis depends on the invading organism. In a minority of cases pus or matter may be found in the joints. The greatest number of cases, however, are due to infection with a soil bacillus, with which there is no pus formation, a swollen, painful condition of the affected part being produced, accompanied by an increase in joint oil.

From the first acute symptoms a sub-acute form is developed, and a small percentage of lambs become chronically affected. Complete recovery, however, usually takes place in probably 80 per cent. of the cases within a month of the onset of symptoms.

By the time the symptoms of this disease are evident, treatment is useless, and consequently every preventive measure possible should be employed. Fresh docking sites, well grassed for preference, should be used each year. The parts to be operated on should be disinfected both before and after operation, care being taken not to use too irritating an antiseptic —a 1 per cent. solution of any of the standard disinfectants is all that is required. This disinfecting should also apply to the operator's hands and overalls. The instruments used should be sterilised by boiling and during use should frequently be immersed in a 2 per cent. solution of disinfectant; this solution should be protected, as far as possible, from contamination with dust. When the operation is completed, care should be taken to place the lambs on their feet.

Preventive measures regarding navel infection will include antiseptic dressing of the navel string of newly-born lambs with tincture of iodine. This form of arthritis is, however, relatively uncommon.

Where this disease is prevalent on a farm, the more common avenues of infection may be reduced by the use of a bloodless emasculator and by the use of a red iron on the docking wound.

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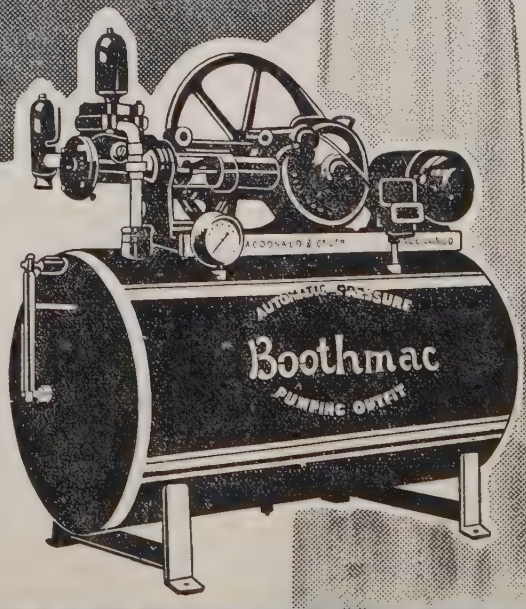

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WHICH COW REPRESENTS YOUR HERD?

Winter Feeding and Rugging Pay

THE accompanying illustrations (Figs. 1 and 2) portray striking contrasts in stock condition due to the degree of care and management (or lack of it) given during the winter months. Fig. 1 shows a beast which received from May to September approximately 8 cwt. of hay, together with reasonably good pasturage. In addition. as is shown in Fig. 3, it was regularly rugged at night and on those days when weather conditions were unfavourable.

The other animal, shown in Fig. 2, had to depend entirely on the meagre winter growth available on a farm where mud was a great deal more plentiful than pasturage. Moreover, during bleak periods, its sole means of gaining shelter consisted of getting up against barbed wire fences. Consequently, its condition, its coat, and its prospective ability to produce must be markedly inferior to that of the other animal.

High production is largely controlled by adequate winter feeding, and, in view of fertiliser shortages, even greater provision in the form of hay and silage should be made this year. Half a ton to even a ton per cow should not be too high a hay provision to aim at, and, if ensilage is preferred, just three times these weights will be needed.

A sound policy, then, would aim at making this a special year for winter feed production. Save as much hay as possible. Turn every bit of spare growth into ensilage. Lessen the drains on winter pasture production, and thereby minimise the effects of reduced fertiliser supplies.

—C. WALKER, Instructor in Agriculture, Thames.

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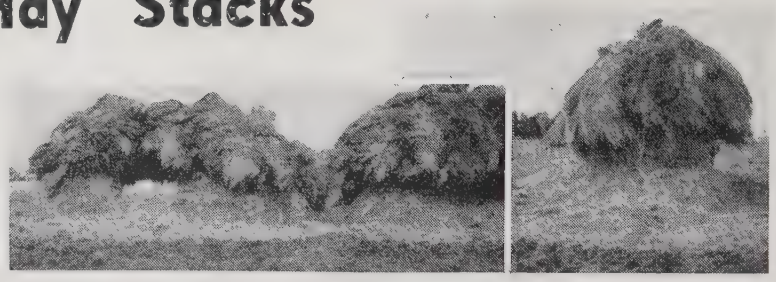
Fence Your Hay Stacks



ALMOST daily, year in and year out, striking instances of hay wastage due to lack of adequate fencing are encountered.

Much time is spent in harvesting and stacking a field of hay, wages are often paid out, and the field is lost to the stock for from two to three months. All these things cost money, and, in the aggregate, they represent a fairly considerable sum. Furthermore, that stack of hay which results has an important purpose to serve in the feeding of stock during the winter period. Without it, stock will not winter well, and, consequently, their production in the following season will be affected. It can, therefore, be claimed that a stack of hay is an important and indispensable unit in farm economy.

Notwithstanding this, however, one frequently sees instances of abuse similar to those shown in the accompanying photographs. Although considerable initial expense has been incurred, no effort is made to protect the supply by the erection of a fence. Consequently, stock feed from the stack, tramping much valuable hay into the mud. At times they even burrow right through a stack (see Fig. 2), and there is a risk of stack collapse.

Photos above—

Right.—**High stack wastage through failure to fence.**

Left.—**Note collapse of stack and tunnelling through stock access.**

[*G. A. Blake, photos.*

Although it may be claimed that other duties prevent the stack from being fenced, such an excuse has little merit. In fact, it would be better not to save hay than to do so and waste it. At the present time, however, we need more hay: we must aim at greater production than in the past to compensate for probable reduction in winter growth, but, in doing so, let us at least make sure that what we produce we adequately protect.

—*C. WALKER, Instructor in Agriculture, Thames.*

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Why Struggle In Mud?

IN the handling of a herd of dairy cows, the presence of almost unlimited quantities of mud can be a most depressing factor. Such a state is inclined to stultify initiative, breed despondency, and create a state of irritability that is reflected in bad temper. The best cannot be expected, then, either from man or beast, no matter what the wages may be or how nourishing one can make the pastures. Conditions must be congenial—they must appeal to stock and staff alike—before optimum results can be expected.

It will be only too obvious that the farmer who permits his gateways and shed surroundings to approach the condition shown in Fig. 1 can expect frequent changes in staff, with consequent drop in production. If his cows come into the yard with mud to their flanks and their udders thickly coated, he should evince no real surprise if the hired hand looks for new quarters. Few will put up with such conditions for long. In fact, it is quite bad enough as a rare occurrence without having such a state of affairs daily through the spring.

There is a simple remedy for this state of affairs—metalled gateways and concrete strips leading to the holding yard. Neither road metal nor cement is subject to any rationing, so both should be employed and used freely in providing better conditions for the stock and the staff.

When this is done there will be none of those sights such as are depicted in Fig. 2; stock will be more contented; the staff will be happier; work will be more congenial; time will be saved; in fact, the farm will be regarded more as a home to feel proud of rather than as a nightmare built up by a life of drudgery.

—C. WALKER, Instructor in Agriculture, Thames.

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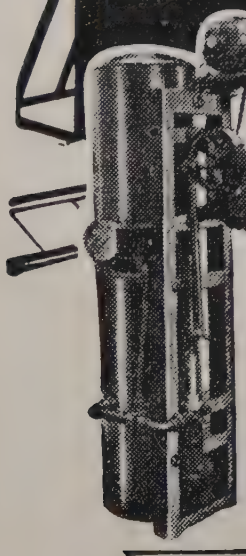

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Answer to Correspondent

Eradicating Indian Doub Grass

R.B. (NAPIER):—

Being a subscriber to the "Journal," I would be much obliged if you would tell me through the correspondence department the best way to eradicate Indian Doo couch grass on sooty country. Would you recommend the rotary hoe or swamp plough for the job? An article on couch grass in your journal would be of help to many farmers.

FIELDS DIVISION:—

Doub can be practically eliminated from a paddock for a number of years at least by either one of the two methods suggested. This grass is a surface rooter, and frequent cultivation with the rotary hoe during hot summer days of January and February will dry out and kill practically all the roots and creeping stems. Cultivation in wet or damp weather is of no use whatever, as this serves only to distribute the stems, which will rapidly re-establish.

The swamp plough can also be used to eliminate the doub to a large extent. The ploughing should be done in May or June when growth has stopped for the winter. The furrows should be 8 to 10 inches deep and turned over as flat as possible; a light discing of the surface to fill in the gaps between the furrows will help in keeping light and air from the buried stems. If completely buried at this time of year with light and air excluded during the wet period of winter and early spring, the creeping stems will generally rot completely and the doub will be reduced to odd plants here and there which have grown from pieces not completely buried.

Of the two methods, the latter is preferred, as cultivation of the type required in the summer with the rotary hoe in this light sandy soil where doub is common is not good for such soils, tending to reduce the humus content and making them still lighter and more subject to fresh doub invasion from seed.

Further the deep ploughing is likely to reduce the seed content of the surface soil.

Orchard Notes

Handling the Fruit Crop

UPON entering another harvesting period, the strictest attention must be given to the handling of the crop, and to ensure that the crop is of good quality operations in the orchard must not be neglected.

With the hot, dry weather, experienced during the day and warmer nights, codling moth will become more active, and applications of lead arsenate will be necessary, keeping the fruit well covered to reduce infection to a minimum. The continued use of lime sulphur, with the addition of colloidal sulphur, is recommended for fungus diseases, but it is advisable to reduce the strength of lime sulphur to 1:200, with colloidal sulphur at 2:100. To obviate spray injury on the fruit or foliage, the better plan would be to use only colloidal sulphur. The addition of hydrated lime when using the combination spray lead arsenate plus lime sulphur or collodial sulphur is necessary to prevent russeting of fruit or injury to foliage.

For the balance of the season it is advisable to anticipate the approximate harvesting dates for the different varieties grown and arrange the spraying accordingly so that the last application of spray will not be so close to picking time that any appreciable spray deposit will be left on the fruit. Much will depend upon the weather conditions at the time, but usually, especially with the later varieties, the spraying programme for the season is finished well before harvesting time.

Control of Red Mite

With the warmer weather, red mite, where not previously eradicated, will become active, and the foliage, calyx, and stem cavities of the fruit will become infected with live mite and summer eggs. This reduces the vitality of the foliage to such an extent that the resultant crop will be seriously affected in both quality and size. The most effective spray at this time of the year for the destruction of red mite is summer oil at strength 1:100. If the application is thorough, both live mite and summer eggs will be destroyed. Any failure to secure control with one application will be an indication that complete coverage was not obtained, and an additional spray will be necessary.

Leaf Roller Caterpillar And Leaf Hopper

These pests cause very serious damage to both fruit and foliage at this time of the year, and vigilance is necessary so that steps may be taken to suppress them as soon as they appear. When the leaf hopper gets to the winged stage it is difficult to control; consequently, an application of nicotine sulphate at strength 1:800 should be applied while the insects are in the nymph stage. Attacks by these insects not only weaken the foliage, but the fruit becomes blemished to such an extent as to make it unsaleable. The damage caused by the leaf roller caterpillar is, in many cases, more serious than codling moth infection. Lead arsenate at 1½:100 is the best protection.

Thinning Fruit

Although the main thinning should be finished, it is sometimes found that too many fruits have been left on the trees, and if so, a further thinning will be found profitable. Close observation of the size of the fruit and the growth made by the tree will give an indication whether the first thinning has been sufficient. Small, undersized fruits are costly to handle and often unsaleable. Diseased, misshapen, and badly russeted fruits should be removed from the trees; in fact, it is advisable to take off all fruits that would eventually go into the lower grades or reject category.

Handling Stone Fruit

There is much more likelihood of wastage in stone than pip fruit, and the utmost care should be exercised in handling it. Points to be considered when dealing with stone fruits are:—

(1) **Maturity.**—This depends largely on the distance the fruit has to travel before reaching the market. The closer the market the more mature the fruit may be, although it must be realised that some days may elapse before it actually reaches the consumer, so that it is better to err on the firm side.

(2) **Picking.**—The greatest care should be exercised when picking to see that no fruit affected with brown-rot comes in contact with sound fruit. Should this happen, the whole of the fruit in the case may be affected before reaching the market. Preference is given to picking tins into which sound fruit can be carefully placed without bruising and which can be sterilised at any time, thus reducing the chances of the spread of brown-rot infection. Bruises on the fruit caused by rough handling when picking will also cause decays and rots to develop very quickly.

(3) **Sizing.**—Good packing cannot be done unless the fruit is sized properly. For sizing correctly a sizing machine, over which the fruit passes ready for

HOUSEHOLD REMOVALS BY EXPERTS

Specialty Railways Service

Expert Railway packers handle household removals so quickly and carefully that the need for the drudgery once inseparable from " shifting " has disappeared. Those prospectively moving to another town should certainly get a quotation from the local stationmaster for packing, transporting and unpacking all furniture and effects—complete house-to-house removal.

Maximum Care—Minimum Cost

the packer, is an acquisition. This machine should be kept free from dirt or anything tending to injure the fruit.

(4) **Grading.**—Stone fruit can be marketed to advantage when packed in grades according to colour and amount of blemish, etc., on the individual fruits. The first grade should consist of well-formed and well-coloured fruit of the variety, free from pests and diseases, on which limb rub, cracking, etc., should be very slight; second and third grade fruits may be slightly lower in these respects than the first grade, but should not contain any defects which might cause the fruit to decay or make it unattractive to the purchaser. Uniformity in maturity is of great importance, and dirty fruit should be eliminated.

(5) **Packing.**—Care in packing is necessary in order that the fruit may arrive at its destination in good condition. The diagonal pocket pack is recommended for safe carriage. On no account should fruit showing signs of brown-rot be packed. Correctness of height of pack is necessary so that no damage to the fruit can be done when lidding. All fruit should be dispatched to the market as soon as possible after packing.

Cover Cropping

Where it is intended to sow cover crops during January it will be advisable to prepare a good seed bed by light cultivations during the month. Several crops may be grown according to their suitability for the district and the requirements of the land. Blue lupin is the most favoured crop where there is a deficiency of humus. An application of superphosphate at the rate of 1 to 1½ cwt. per acre when sowing the seed will help considerably in the production of a good crop for ploughing in later in the season.

—G. STRATFORD, District Supervisor, Dunedin.

Citrus Notes

Recognition of Citrus Varieties

GRAPEFRUIT of American varieties which have been planted in New Zealand are Marsh, Thompson, Foster, and Duncan. These are dwarf trees with large foliage. The leaf is dark green in colour, with serrated edge and distinct winged petiole. These varieties are regarded as hybrids between the pomelo and the lemon, and bear fruit in grapelike clusters; hence the name grapefruit.

Marsh is the standard variety. The fruit is a light yellow colour, with smooth rind, and is distinctly flattened at each end. Under New Zealand conditions, the rind is generally thick. It has a large open pith, and is practically seedless.

Thompson is a sport from Marsh, but the flesh is pink instead of amber coloured. The pink colouration of grapefruits is similar to the red colouration of blood oranges in that it develops with heat and maturity and may not be apparent under unfavourable conditions.

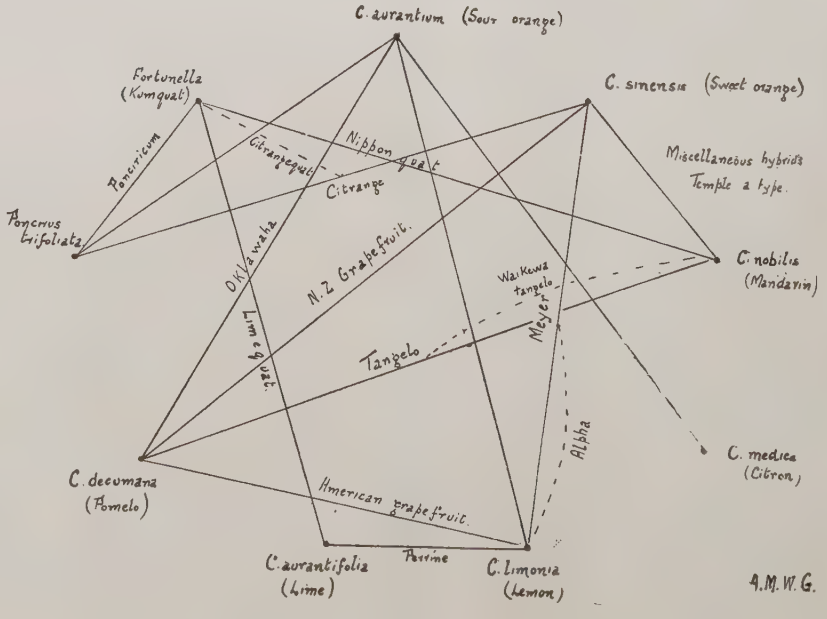
Walters. The fruit of this variety is generally much larger and rounder than Marsh, but is described as oblate —that is, spherical but flattened at each end. The flesh is first yellowish, but later turns whitish when maturity is reached and the fruit is in its best edible condition.

Foster is a sport from Walters, flesh pink rather than yellow in colour. This pink colouration is often seen on the inner surface of the rind when not visible in the flesh. There is usually a large number of seeds.

Wheeny. This variety is an introduction from Australia, and may be classified here, as it is a grapefruit of the same pale yellow colour as the American varieties, but has been observed locally to be much more thin-skinned and juicy. The fruit is larger than Marsh. The foliage is much more upright, similar to New Zealand grapefruit, rather than having the spreading habit of American varieties. The young leaves in spring are often crinkled because of cold winds, and the leaf petiole is not as large as with other grapefruit varieties already listed.

The best-known pomelo-sweet orange hybrid is the Poorman orange, or New Zealand grapefruit. This tree is a vigorous grower, and is upright rather than spreading. The fruit can be described as a bright yellow in colour, more golden than the lemon, but not of such a deep colour as a well-ripened orange. It averages 3¼ inches in diameter, and is distinctly flattened at each end. The fruit is generally juicy and, when cut, it shows about 13 segments with a large central core. The flesh is tangerine-coloured, and it has a pleasant sub-acid flavour. Seeds, when present, are large, but most of

Citrus Hybrids



The citron (Knights).

the finest strains are practically seedless. Young trees, however, often bear seedy fruit.

As hybridisation is such a common occurrence in the genus citrus, and as uncommon varieties are sometimes encountered, the accompanying chart has been prepared to illustrate the position.

From the above it can be seen that the standard species are:—

Citrus aurantium—the sour orange.
Citrus sinensis—the sweet orange.
Citrus nobilis—the mandarin.
Citrus medica—the citron.
Citrus limonia—the lemon.
Citrus aurantifolia—the lime.
Citrus decumana—the pomelo.
Poncirus trifoliata—trifoliate orange.
Fortunella sp.—the Kumquat.

Reference has already been made in these notes to the recognition of varieties of lemon, lime, sweet orange, mandarin, and to a few of the better-known hybrids. The following are a few notes on the remaining species listed above.

The Sour or Seville Orange.—This tree is very thorny. The foliage is generally a lighter green than sweet orange, the leaf is smaller and more pointed, the petiole is more winged, and the veins are not as readily observed on the upper surface. The fruit is coarser in texture than the usual sweet orange, and is very subject to *citrus verrucosis*. It is usually about 2½ inches in diameter, round but flattened at each end, and a golden yellow colour.

The Citron.—This species, both in foliage and fruit, appears to be closely related to the lemon. The fruit is like a large, coarse, elongated lemon, and the leaf, in colour and serrated edges, is like that of the lemon but larger. It can be distinguished, however, by size of foliage and fruit, and the distinct aromatic perfume of the fruit rind. The wood is much softer and lighter than the lemon, and the tree is more subject to frost injury.

The pomelo or shaddock is one of the parents of the hybrid American and New Zealand grapefruit. The tree bears immense dark green foliage, the leaf having the largest winged petiole of any species of citrus. The fruit is

Reminders for the Month

Conserve soil moisture in the citrus orchard by mulching, light hoeing and discing.

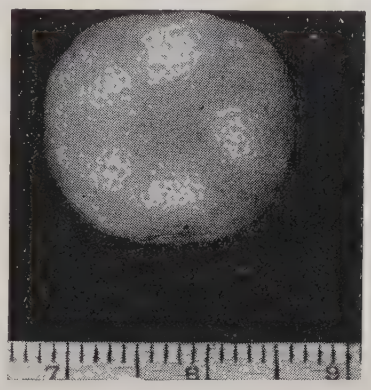
Build up the organic matter in the soil.

Now is the budding season.

Check over trees for the appearance of scale insects.

Order summer oil requirements early.

Continue with pruning and maintain vigilance for citrus-borer.

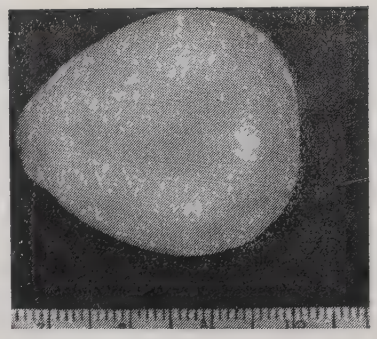


The kumquat.

also very large, being round, oblate, or pear-shaped. The rind is very thick, sometimes 2 inches thick, the flesh is pale yellow or reddish, and the juice acid and often very bitter.

Poncirus trifoliata, the trifoliate orange, has already been mentioned as a rootstock. It can readily be recognised by the three leaflets, thorns, deciduous nature, and mottled appearance of the bark.

The Kumquat is a small ornamental tree, bearing small oblong golden



The tangelo.

yellow fruit with smooth, aromatic, spicy rind, which makes it good for marmalade. The leaf is similar in colour and size to that of the mandarin, but it has a smooth and not a serrated edge, and the surface is less glossy. It is fairly frost-resistant.

The various citrus hybrids of interest not already mentioned are:—

Citrange.—A hybrid between sweet orange and *P. trifoliata*, is a vigorous tree, and valuable as an ornamental, being very attractive in foliage, flower, and fruit. The deciduous habit is only just apparent, because young foliage appears as the older foliage is shed.

Tangelo is a mandarin pomelo hybrid which bears attractive-looking pear-shaped fruit.

Limequat is a lime-Kumquat hybrid. The fruit is oval, medium sized, and is borne in clusters. The leaf is similar to that of Kumquat, but larger. The fruit is reported to make good marmalade.

This concludes the series on the recognition of citrus varieties in New Zealand.

—A. M. W. GREIG, Citriculturist, Auckland.

Cool Storage Notes

Overhauling the Cool Storage Plant

FRUIT cool storage chambers will now be empty and the refrigerating plants shut down for the season. All the machinery and plant should be thoroughly overhauled to ensure that it is ready for the coming fruit season. The services of a competent refrigerating engineer will be necessary to carry out an inspection of the power plant, ammonia compressor and condenser pump, and to undertake the necessary repairs and replacements of wearing parts.

The following points, in particular, should be given attention:—

(1.) The packing in the compressor gland should be examined and renewed if it is found to be faulty, as this gland, when neglected, is a potent source of leakage of ammonia.

(2.) A spare set of compressor valves should be always on hand, as the valves in the compressor may require replacing during the busy season.

(3.) The main compressor stop valve seatings, spindles, and gland packing should be inspected.

(4.) The ammonia expansion valves must also be examined, as these valves

(*Continued on page* 526).

Guide for the Home Garden

Work in the Garden for January

IF properly grown and kept free from disease, tomatoes will be well up the stakes and with the bottom truss of fruit coming to a good size towards the latter end of January. As soon as these tomatoes are noticeably maturing and fruit is beginning to set further up the stems, careful examination should be made in order to discover any signs of lack of vigour in the plants. "Stunting" of growth will be manifest by a change in the colour of the main stem (near the top) from the healthy green to a light purple shade. This is most likely to take place if, at planting time, insufficient fertiliser has been applied. The remedy is obvious—more plant food should be applied.

Blood and bone is at all times the safest fertiliser in the home garden, with the addition of potash, but at this stage of development frequent applications of liquid manure will be beneficial. Should unmistakable signs of hardening be apparent, no potassic fertilisers in any form should be applied.

The sun and wind should be sufficient to keep the plants healthy, apart from the spraying routine, which must at all times be observed. The plants should be kept well tied to the stakes, and fastenings made every 10 to 12 inches will maintain an upright and vigorous growth, while the removal of surplus growths must not be neglected.

Regular cultivation for the destruction of weeds and to assist in the conservation of soil moisture is essential. As previously indicated, the most practical tool for the above purpose is the "McKinnon," or, as it is sometimes named, the "torpedo" hoe.

Other Crops

During January, the planting of autumn and winter maturing cabbages and allied crops should be completed. In the home garden, on a small scale, the following treatment may be given a trial for caterpillars on cabbages:—Spray with a solution of salt-water at a strength of 2oz of salt to 1 gallon of water.

A careful watch will need to be kept for aphis, which may become destructive during prolonged periods of dry weather. In the early stages of growth nicotine sulphate or arsenate of lead (powder form), and later Derris, will, if properly applied, preserve the plants from the depredations of these pests, and at the same time account for caterpillars.

Lettuce

Seed of this desirable salad vegetable may still be sown, but, unless plenty of water is available for seedlings when transplanted, the seed should be sown where it is intended the plants are to grow to maturity. As soon as the seedlings are large enough, they should be thinned to 12 inches apart in the rows. A similar distance should be allowed between the rows. Special varieties are obtainable for summer production.

When applying water to growing lettuce, give the soil a thorough soaking, followed by occasional applications of liquid manure. This will materially assist in the production of a crisp plant which is so much appreciated as a salad.

French Beans

In localities where relatively frost-free conditions obtain for the next 2½ to 3 months, a sowing of French beans may be made with every chance of the crop maturing. Any of the dwarf varieties which require from 70 to 90 days to mature can be recommended.

Applications of liquid manure, and keeping the crop regularly picked, will prolong the profitable life of the runner or climbing bean varieties. Towards the end of the season a few pods may be left to produce seed for the following season, always provided the plants are free from disease. Many diseases are seed-borne, and plants grown from diseased seed can hardly be expected to be profitable.

Turnips and Swedes

Turnip seeds may still be sown, the product of which will be a welcome addition to early cauliflower and winter greens. If not already done, the seed of swede turnips should be sown without delay. A bed of swedes, if properly protected, will produce plants which should mature and provide supplies well into spring. As soon as the young seedlings appear, they should be sprayed with nicotine sulphate or arsenate of lead (powder form). For insecticidal purposes Derris may be used either as dust or as a spray. If protective measures against insect attacks are not adopted, the whole sowing may be quickly destroyed. A plentiful supply of water is essential for good growth of this vegetable.

The seed of both varieties may be sown in rows—always in preference to broadcast—12 to 15 inches apart, but the swedes should be thinned to 6 inches apart in the row.

If the crop preceding swedes has been liberally supplied with fertiliser, the addition of superphosphate at the rate of 1 lb. to 6 yards of row will be adequate for a reasonably good crop.

Spinach

A sowing of spinach may still be made, and in doing so it should be remembered that spinach is a "long day" plant. Contrary to what may occur in some vegetable plants, high temperature will delay the formation of seed stalks in spinach, and, as a result, seed sown in summer is not likely to run so quickly to seed as that sown in spring. Plenty of water and liquid nitrogenous fertiliser will encourage the rapid growth of tender green leaves.

Spring Cabbage

Towards the latter end of January, in cold districts, seed of Suttons Flower of Spring cabbage may be sown in outside beds or seedling boxes.

—D. K. PRITCHARD, Instructor in Vegetable Culture, Wellington.

Seasonal Don'ts

Don't

defoliate tomato plants unnecessarily. A slight defoliation, such as the complete removal of the lowest leaves as they begin to yellow, to increase the passage of air through the plant, is permissible.

Don't

allow tomato laterals to grow. They rob the developing fruits of necessary sap. Only in the glasshouse, where every inch of leaf-surface is required to protect the fruit from the scorching sun, which leads to the development of blotchy ripening through rapid transpiration, should laterals be allowed to develop. This applies especially where tomato leaf-mould is present in the glasshouse.

What to Do in the Garden Next Month

Summary of Operations During January

VEGETABLE SECTION.

SUCCESSIONAL SOWINGS.

Dwarf beans, lettuce (grow without transplanting), peas (early dwarfs after the middle of the month), radish and spring onions (water well), turnips. Other Sowings.—Endive.

SEEDLINGS TO TRANSPLANT.

Borecole, broccoli, Brussels sprouts, cabbage (savoy, winter and red), cauliflower, celery, leek.

SPECIAL NOTES FOR COLD DISTRICTS.

Sow spring cabbage towards the end of the month (in other districts late February).

CROPS IN SEASON.

(The month in brackets represents the month of sowing the seed.)

Salads.—Lettuce (Oct.), radish (Dec.), corn (Oct.), outdoor tomatoes and cucumbers (Sept.).

Greens.—Beans (Sept., Oct.), marrows (Aug. sowing in warm districts), peas (Onward and Alderman), New Zealand spinach (Oct.).

Roots.—Beetroot (Sept. main crop and last of the Sept. earlies), carrots (Sept. shorthorn and main crop), parsnips (Aug.-sown Oxheart), potatoes (main crop), onions (Mar. and July-Aug.), shallots (Aug.), potato onions (May), pumpkin (Red Warren in warm districts), turnips (Nov.).

GENERAL WORK.

Spray on fine mornings for potato and tomato blights. Use derris dust to control white butterfly.

Water well when necessary, and maintain a surface mulch to conserve moisture and to control weeds. Make the cultivation shallow where crops are approaching maturity.

Dig under any harvested crops, such as peas and beans, but burn potato haulms, cabbage and cauliflower stumps promptly.

Tie up and prune outdoor tomatoes.

Sow a cover crop on any ground that is not being used for cropping.

Harvest onions as they mature.

Lift vines on kumara patch to prevent them from rooting at the nodes.

Continue to earth up potatoes and other crops.

GLASSHOUSE SECTION.

As harvesting is completed the tomato vines should be removed from the house and burnt. Pull the vines up from the ground and leave them hanging for several days to dry out before burning them.

Thereafter on a calm night seal the house and burn sulphur in it (2 lb. per 1,000 cubic feet).

This done, the house should be thoroughly cleaned and any repairs effected and painting done.

The ground should be cultivated and a cover crop sown.

Watering During Drought

THERE is a great temptation to apply water at frequent intervals to both vegetables and flowers during spells of dry weather. It is common for water to be applied too frequently and in too small quantities to be of much use. Frequent light waterings maintain the surface of the soil in moist condition, but where insufficient water is applied to penetrate deeply into the soil, a great amount of harm may be done. The roots of plants are attracted to the moistened top layers where, if the watering is discontinued for even a short period, they will surely suffer if these layers dry out.

When watering has to be done, sufficient should be applied so that it can penetrate to the subsoil. Then, if the surface of the soil is loosened as soon as it is dry enough, the soil mulch that will be produced will protect the store of water in the soil from the drying influences of the sun and wind. The plants are then encouraged to send their roots deep into the soil in search of both food and moisture. In such a position they are relatively immune to the effects of drought, and an occasional watering to moisten the ground thoroughly keeps them thriving.

On soils which drain very readily it will be necessary to water more frequently than on those which are more retentive of moisture. The sooner overdrained soils can be adequately supplied with humus the better, as humus, acting as a sponge, holds water and makes it available to plants. The humus content may be increased in a number of ways. Compost, farm manure, or a green manuring crop may be dug into the soil. The soil may be mulched with similar material which, in addition to shielding the soil from the intensity of the sun, supplies valuable humus.

Treatment of Small Fruit Plantations

AS the picking season passes, the small plantations require attention. A small amount of pruning is required, after which the ground should be lightly cultivated and a cover crop sown. A light dressing of superphosphate (about 1cwt per acre) should be applied at the time of sowing. This cover crop should be planted in all the plantations mentioned below, with the exception of strawberries. Farm manure, if available, may be applied in place of or in addition to the cover crop.

The pruning which the different fruits require is as follows:—

Strawberries.—In districts where an autumn crop is expected, and in those where the beds remain down for two or three years, all runners should be suppressed from fruiting beds. Where new plants are required, runners should be allowed to develop on plants that are not allowed to bear fruit. These produce more vigorous plants.

Gooseberries.—Little, if anything, is to be gained by summer pruning gooseberries, unless it be to remove branches damaged as a result of picking and the young sappy growth from the centre of the bush. These, when six to eight inches long, should be pulled out in preference to cutting.

Currants.—From black currants the wood which has borne fruit should be cut back to strong young side branches or removed entirely, leaving only the young wood which will bear next season's crop of fruit. It is advisable,

(*Continued on page 533*).

Seasonal Work for Beekeepers

Colony Requirements and Honey Flow

THE beekeeper should make every effort to secure a large population of worker bees in each hive, and should not neglect to keep all colonies well supplied with food in the event of a change to unfavourable weather conditions. Brood-rearing must be kept going at all costs at this time of the year, and any colony which has failed to make good progress requires special attention. The average time required for the development and emergence of the adults is, on the average, 21 days for the worker, 16 days for the queen, and 24 days for the drone. These are the periods when the normal temperature of approximately 93 degrees Fahrenheit is maintained by the bees in the cluster or brood centre, but with higher or lower temperatures these developmental periods are decreased or increased accordingly, and, in the case of the worker bee, may vary from 20 to 24 days.

It is therefore very necessary that all colonies are provided with sufficient protection from cold winds and artificially created draughts within the hives, so that as far as possible a uniformly high temperature may be maintained within the brood nest for the most economic use of the brood-rearing space in the production of worker bees.

Suitable shelter, especially at ground level in all apiaries, is essential, and all hive parts should be close fitting to prevent draughts. Even in well-cared-for apiaries a number of queens each year may fail, for no apparent reason, to keep up egg-laying at a rate necessary to provide sufficient worker bees to store a good payable surplus crop of honey. While some allowance must be made for bad weather and low temperatures during the season, all colonies should reach their maximum strength at this time of the year or by the end of December in southern parts of New Zealand.

Commercial beekeeping, therefore, requires a complete knowledge of the life history and habits of the bees, so that each colony in the apiary is brought to the peak of population at the proper time without swarming.

Main Honey Flow

In most parts of New Zealand clovers are the main source of nectar supply, which usually last a month to six weeks from the beginning of December, according to location, but some seasons there is no main honey flow at all. This may be due to the absence of clover bloom due to drought conditions at a critical period, or, on the other hand, the honey plants may be present but weather conditions may be unfavourable for nectar secretion. During the period of preparation the beekeeper must be guided by local conditions from week to week and endeavour to build up each colony to reach as near as possible their maximum strength to coincide with the start of the main honey flow.

Medium Colonies

Where the beekeeper has provided proper and adequate accommodation for the queen and bees and there has been no shortage of pollen and honey, the poor condition of any colony may be attributed to a poor or failing queen, but, whatever the cause, no medium-strength colony should be allowed at this time to continue as a separate unit for the production of honey. All such colonies should be doubled up and united, two into one, by the paper method. This may be done by removing or killing the queen of one colony and placing the complete brood nest, queen and all, with the bees of another, on top, with a single or double sheet of ordinary newspaper between. If the weather is good and there is a honey flow at the time, a single sheet of paper will do. The bees in both hives placed together in this way quickly gnaw through the paper and unite peacefully as a single unit.

Where this work has been done at the proper time, the queen is usually forced below by the storage of honey when the main flow begins; otherwise it is advisable to adjust the brood nests suitably in the two bottom chambers. But where queen-excluders are used the queenless portion may be placed on top and a watch kept for queen cells.

The short life of five or six weeks of the worker bees during the honey season and the variable length of the summer seasons make it no easy problem for the beekeeper to manage his colonies so that they will reach their maximum strength in time for the storage of surplus honey in the supers.

Supering

When the main honey flow begins, colonies with a large force of field bees usually collect nectar so rapidly that it is stored in every available cell. Therefore, the beekeeper must make immediate provision by adding another super to each hive; otherwise conditions become so cramped that the queens are unable to carry on with their normal egg-laying activities, and brood-rearing is curtailed accordingly. Where this happens the worker bee population is reduced too soon because of the very high death rate during the active working period of the summer months. A clear indication of the necessity for more super accommodation above the brood chambers for the storage of honey is when the combs are fairly well filled with brood and honey and the bees begin to build out the combs along the top edges, giving them a fresh, clean, white appearance.

At this stage, an extra super of empty combs or foundation should be placed on each hive, but, before doing so it is advisable to ease the congestion in the brood chambers by removing two or more honey combs from the outer edges of the brood nest, taking care not to take fresh pollen combs or unsealed brood. These combs should be placed in the centre of the added super, and their places filled with good empty worker combs or foundation.

This not only has the effect of easing congestion in the brood nest, but also draws the worker bees into the super above. Three or four combs partially filled with honey—when completely capped—placed in the centre of the super directly above the brood nest, will usually check the queen laying eggs in this honey super where queen-excluders are not used, but where the

(*Continued on page* 526).

APPLICATIONS (to be made on P.S.C. Form 17A, obtainable at principal Post Offices), with COPIES ONLY of testimonials, will be received up till NOON on the 31st DECEMBER, 1941, for the position of APIARY INSTRUCTOR, 2nd Grade, General Division, DEPARTMENT OF AGRICULTURE, at a location to be decided. Salary £305 p.a., maximum £335 p.a., plus Public Service bonus, usually £13 p.a.

It is desired that applicants should have had experience in practical bee-keeping and possess a thorough knowledge of foulbrood and other bee diseases and methods of treatment; and should also be capable of writing articles and delivering addresses on the bee-keeping industry generally.

The successful applicant will be required to bear any expense incurred in travelling to take up appointment, which will be subject to the provisions of the various Acts and Regulations affecting the Public Service.

Secretary,
Public Service Commissioner,
Wellington, C.1.

"BAD EGGS"

How To Avoid Complaints This Summer

WITH the approach of summer, and, it is to be hoped, warm summer weather, the problem of marketing eggs satisfactorily under these conditions has once again to be faced. During last January there were numerous complaints of "bad eggs" throughout the Dominion, and as a result of this outcry the Department of Agriculture made an immediate investigation of the situation. The "Journal" published a report of the investigation in the following May issue, and the time has now arrived when poultrykeepers should bear in mind the main points set out in this report.

The data collected in January indicated that the dry, hot weather and consequent lack of green food available for feeding laying stock contributed largely to the rapid deterioration of eggs last summer. A special appeal was made to poultrykeepers when the report was published, indicating the real necessity for looking ahead to secure an ample supply of green food for the present season. It is to be hoped that poultrykeepers have profited by last season's experiences, and have grown satisfactory supplies of green food for this summer.

It is fully realised that certain factors, beyond the control of the poultrykeeper, may seriously affect quality before eggs reach the consumer. Nevertheless, any neglect by the poultrykeeper which directly or indirectly leads to the lowering of quality brings discredit upon eggs and thus renders a definite disservice to the industry. It is generally agreed that as the laying season progresses there is a tendency for egg quality to be lowered, more especially with eggs from high producing birds. As this is the case, it becomes essential that additional care should be taken during hot weather, when deterioration can be so rapid.

Common-sense management can do much to prevent marketing troubles, and the list which follows sets out the main management points requiring attention at this time of year. They are **all essentials** and **none** should be neglected.

(1) Feed daily an ample supply of fresh green food to all laying birds. Green food may be fed separately or mixed in with a wet mash. Should birds show signs of eating an inadequate amount when fed separately, then the green food should be included with the wet mash. This will ensure that satisfactory amounts are eaten during the summer months.

(2) Ensure adequate supplies of oyster shell grit or its equivalent at all times. Egg shells often deteriorate during the flush season and as the laying season advances. Poor shells mean losses in "cracked eggs" and, in addition, lead to rapid deterioration of the egg contents. This was noticeable during the investigations made last summer.

(3) Laying birds require unlimited fresh water during hot weather. Any lack of this essential may result in a loss in egg size.

(4) Eggs should be collected twice or three times daily during hot weather. This is an important point, as nest boxes are often hot and usually have one or more birds sitting in them. An additional danger is the broody hen which is constantly in a nest box until removed to the broody coop. When eggs are subjected to many hours of heat in a nest box considerable damage is done to the quality of their contents. This is a small practical point, but one which is too often overlooked.

(5) As soon as collected all eggs should be placed in a cool room. On many farms the egg stores are too hot, and this should be remedied at once if at all possible.

(6) Many poultrykeepers use kerosene tins in which to collect eggs. These tins are useful, but dangerous if the eggs are left in them until required for packing. As no cool air can circulate around eggs collected in these tins, the eggs remain warm for a long period. They should be taken out as soon as possible and placed upon a wire netting or wooden rack to cool. Wire baskets, where available, are the best type of equipment for collecting eggs, as air is able to circulate freely among the eggs and thus prevent "sweating."

(7) When a tin or basket has been filled with eggs **do not place it outside a laying shed or egg store in the sun.** It is surprising how often poultrykeepers leave eggs in the sun, either in tins or egg crates, although in all cases they would agree that the practice is a bad one.

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Mr. Alan M. Doull was until recently, Manager and Buyer of the Grain and Produce Departments of Messrs. Turner & Growers Ltd., and has an extensive knowledge, acquired over a period of 21 years.

(8) **Do not wash eggs unless they are really dirty.** Egg-washing machines are great labour-saving devices. There are, however, good reasons for believing that they are responsible for much trouble in the marketing of eggs, especially during hot weather. It is an accepted fact that eggs required for incubation purposes **should not be washed** if the best results are to be obtained. Washing removes a protective layer on the shell, without which hatching is liable to suffer. It is therefore reasonable to believe that, once this protective layer is removed by a washing machine or by standing eggs in water, there is every chance of these eggs deteriorating more rapidly during the period of marketing.

Some years ago a special appeal was made to poultrykeepers in England not to immerse eggs in water, but to use only a **damp** cloth. This appeal was made in order to stop trouble that was being experienced with washed eggs during marketing. Although under New Zealand conditions it may not be possible to spare labour for wiping eggs with a damp cloth, greater care and common-sense could be exercised in the use of washing machines.

Only eggs showing an appreciable amount of dirt on the shell should be washed.

On many farms eggs are put over the washing machine irrespective of the amount of dirt on the shells—this is said to save time as against picking out only the dirty eggs. In view of the reduced keeping quality of washed eggs during hot weather, this practice is to be condemned. Similarly, any neglect in the strict maintenance of cleanliness of the material used on the rollers of egg-washing machines may cause trouble with washed eggs after they have left the farm. These rollers are allowed to get slimy, and in consequence "taint" the eggs passing down the machine.

Egg-washing machines have definite advantages for the producer, but as used today are causing unsuspected trouble.

(9) It is important that eggs should **not be washed** until they have **cooled off** completely:

By carrying out the suggestions offered above—not some but **all** of them —poultrykeepers will be contributing their part towards avoiding an outcry of "bad eggs" by the consumer this summer. It is to be hoped that all those responsible for handling eggs after they leave the farm will do their share in helping to give the consumers what they require—good quality new laid eggs.

Chick-sexing Examination

A CHICK-SEXING examination for Certificates of Merit was held by the Department of Agriculture at the Poultry Farm, Massey Agricultural College, Palmerston North, on November 4, when two candidates presented themselves for examination. Unfortunately, both candidates were unsuccessful, but have signified their wish, circumstances permitting, to be re-examined at the next examination to be held in July, 1942, at a centre to be selected at a later date.

The facilities provided by the college authorities were fully appreciated.

APIARY NOTES.

(*Continued from page* 524).

queen does find her way above, any combs containing eggs or larvae should be placed down in the brood area at the next visit to the apiary, after which the rapid storage of honey will keep the queens out of the supers if they were added in accordance with good apiary practice.

When the honey flow is exceptionally rapid and the colonies are very strong, added honey supers may be placed one at a time under those which are partly filled. It is a mistake to wait until the honey super directly above the brood nest is full and the honey capped over before adding another super, as this method does not allow sufficient comb room for a suitable distribution of the fresh nectar gathered each day for ripening purposes.

It is good apiary practice in New Zealand to have at least four boxes of combs for use by each colony as required, and the beekeeper who skilfully supers his hives at the right time in accordance with weather conditions and nectar supply thereby increases his honey crop.

—T. S. WINTER, Senior Apiary Instructor, Wellington.

COOL STORAGE NOTES.—Continued from page 521.

are being operated daily throughout the year.

(5.) The ammonia compressor should be scraped of all loose paint and rust, and be given a coat of paint. This will protect the machine from rust and improve the appearance of the plant.

(6) Belting used for power transmission should be overhauled and repaired as a safeguard against stoppage during the busy season.

(7.) Air circulating fans should be examined, cleaned, and painted.

(8) Line shaft bearings should be inspected, cleaned out, and refilled with oil. A spare set of these bearings should be on hand for use in an emergency.

(9.) Repairs and renovations to the ammonia condenser are always necessary at the end of a season's run. All old paint, scale, and rust should be chipped and scraped from the metal, and the condenser painted with a reliable brand of anti-corrosive paint.

(10.) Expansion coils in dry batteries and expansion piping placed near the walls or ceilings of cool storage chambers should be cleaned of rust and scale, and then given a coat of aluminium or other anti-corrosive paint.

(11.) Wet battery coils and brine distributing trays should be thoroughly examined. If the brine solution is distributed over galvanised iron trays placed on the top of each coil, these trays should be carefully examined, as they may require renewing, particularly where the trays have been in use for a number of years.

(12.) The ammonia pipes of a wet battery should not be allowed to become dry after the plant has been shut down at the close of the season. During the shut-down period the brine circulating pump should be started and run for a few minutes twice each week. When this is carried out a coating of calcium brine solution will protect the pipes from corrosion.

Repairs and Renovations

Before undertaking renovations and repairs to the storage chambers, the thermometers used for registering cool storage chamber temperatures should be removed to the office for safety, as they are easily damaged but not so easily replaced.

Faulty lining timber or insulating material that has deteriorated from damp conditions should be removed and replaced. When carrying out repairs of this nature, care should be taken to lap and thoroughly seal the moisture-proofing material between the lining timbers. When repairs have been completed, the interior walls and ceilings of the chambers should be painted with aluminium paint or whitewash. Chamber doors should be examined and the padding repaired, and door fasteners and hinges should also receive attention.

If the foregoing points are given careful attention at this time of the year, the refrigerating plant and cooling equipment should give little trouble, if any, and operate with a minimum of attention during the coming season.

—A. A. POWELL, Cool Storage Officer, Wellington.

Young Farmers' Clubs Are Asked To Help In The Collection Of Ergot

By S. FREEMAN,
Organising Secretary.

THE attention of all members is drawn to the articles dealing with the collection of ergot, which appeared on pages 397 and 399 of the November issue. Members are urged to read and study these articles so that they will realise the importance of the matter and understand exactly what is required.

At a meeting held recently in Wellington, representatives of the New Zealand Farmers' Union, Women's Division, Women's Institutes, primary and secondary schools, Boy Scouts, Girl Guides, and grain and produce merchants pledged themselves to do everything possible to interest their members in this important project. The Young Farmers' Clubs organisation was represented at the meeting.

The Y.F.C. Federation is particularly desirous that every unit of the organisation should assist in making the campaign a success. It is realised that many club members may have little time at their disposal to devote to the actual collection of the ergot, but clubs and members generally can assist materially in other ways. The urgency of the matter is indicated in the articles referred to, and a careful study of these articles will enable members to give advice and information to those who are able to undertake the collection of the material; they can explain exactly what is needed, describe and identify the particular grasses—tall fescue and marram grass—and give information regarding areas and localities where ergot is likely to be found. Such information will be of value to parties of school children and others who may undertake the work. The grain and produce merchants have agreed to give all possible assistance, and information in regard to areas, etc., will be useful to them also, enabling them to pass it on.

Those engaged in the collection of ergot will, of course, be expected to realise their responsibilities and duly respect farm property, leaving gates, etc., as they find them so as to cause no annoyance.

It may be possible for some clubs to organise collecting parties, and as payment will be made for supplies, the work as a spare-time job may have an added interest. Full information and suggestions in connection with the collection of the ergot are given in the articles mentioned, together with details regarding payment by grain and produce merchants, who have undertaken the handling of the material; it is therefore unnecessary to go further into the matter here.

It can be stressed, however, that club members can help the campaign in many ways, and that by so doing they will be rendering a service of inestimable value to the Empire. Young Farmers' Clubs members have never yet turned a deaf ear to an appeal of this nature, and if the seriousness and urgency of this campaign for the collection of ergot is fully realised, it is expected that the response to this request will be a ready one.

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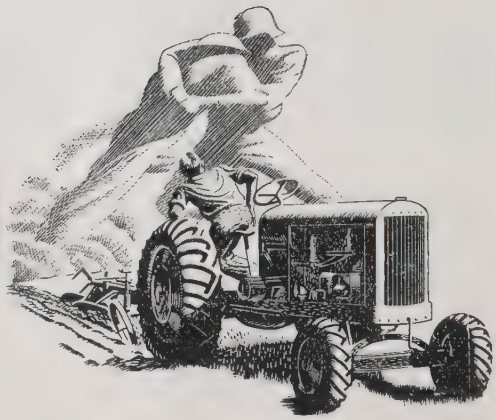
HE WENT FORTH



ARMY.

Name.	*Club.*
Alexander, N.	Ellesmere
Bush, A.	Marton
Bell, W.	Midhurst
Belcher, N. M.	Cardiff
Boland, M. J.	Murchison
Bailey, J.	Murchison
Bethell, A.	Amuri
Belton, T. H.	Amuri
Balsom, A. W.	Mangorei
Bagshaw, D.	Mauku
Black, D.	Paengaroa
Bethell, V. A.	Paengaroa
Bulloch, S.	Paengaroa
Bateman, K. E.	Dannevirke
Bracegirdle, F. J. M.	Inglewood
Brown, V. A.	Dannevirke
Brown, H. J.*	Mangaweka
Coe, C. L.‡	Ellesmere
Coe, R. B.	Ellesmere
Cook, A. R.	Marton
Chapman, L. H. C.	Pleasant Pt.
Chapman, E. J.	Pleasant Pt.
Crombie, R. A.	Pleasant Pt.
Cations, A. G.	Pleasant Pt.
Campbell, R. D.	Five Forks
Cooper, C. E.	Inglewood
Crawley, R.	Dannevirke
Dombroski, V. R.	Inglewood
Dunbar, K. I.	Amuri
Dunbar, T. G. A.†	Amuri
Drummond, H. Y.	Five Rivers
Doole, R. C.	Matapiro
Doyle, H. W.	Opiki
Ewing, C.	Five Forks
Ewing, E.	Five Forks
Flanagan, G. D.	Mangaweka
Gibbons, H. J.	Rongotea
Gibson, E. A.	Te Puna
Gordon, H. E.	Pukehina
Gibson, O. E.	West Taieri
Gilbert, P.	Maunga-karamea
Goosman, A. B.	Mauku
Galpin, C. T.	Paengaroa
Gillies, H. D.	Five Forks
Gyde, D. B.	Inglewood
Hogg, S. E.	Dannevirke
Harvey, J. McL.	Dannevirke
Hooper-Smith, E.	Dannevirke
Hitchcock, N.	Palmerston
Hunter, R. E.	Matapiro
Hayes, S. R.	Murchison
Hill, A. T.	Murchison
Harvey, Y. C. G.	Five Rivers
Howl, R. E.	Rongotea
Hurford, W. L.	Ellesmere
Judson, J. H.	Midhurst
Jordan, N. K.	Cardiff
Johnston, I. A. K.	Palmerston
Jenkins, L. T. H.	Mauku
Johnston, G. W.	Five Forks
Johnston, J. C.	Mangaweka
Karaitiana, Daddy (Maori Battalion)	Dannevirke
Kerr, W. T. W.	Dannevirke
Kemsley, C. W.	Cardiff
Legg, J. C.	Ellesmere
Larkin, D.	Rongotea
Lilley, A.	Five Rivers
Lynch, K. J.	Murchison
Ludeman, D. H.	Five Forks
Manley, B.	Dannevirke
MacDonald, D.	Dannevirke
Mortensen, G. A. T.	Paengaroa
Manning, N. W.	Paengaroa
McLure, J. S.	Paengaroa
McDowell, R. J.	Paengaroa
McLure, G. S.	Paengaroa
Morrison, R. J.	Cardiff
Mander, O. T.	Cardiff
McLennan, D.	Marton
Marshall, H.*	Marton
McGill, K. I.	Ellesmere
McLachlan, D. G.	Ellesmere
Moore, T. B.	Ellesmere
Northcoate, G.	Five Rivers
Nalder, R.	Murchison
Niccol, M.	Dannevirke
Orr, J. B.	Opiki
Percival, D. R.	Maunga-karamea
Platt, N. R.	Kaponga
Pearce, W. J.	Mangorei
Pagan, T. E.	Pleasant Pt.
Paget, E.	Opiki
Raynor, B. J.	Cardiff
Rietchison, M. P.†	Five Rivers
Radford, C. D.	Mangorei
Robinson, D.	Dannevirke
Reid, K. W.	West Taieri
Sutton, M. S.	Inglewood
Stoddard, H. R.	Paengaroa
Singleton, R. D.	Paengaroa
Singleton, J. K.	Paengaroa
Shaw, D.	Palmerston
Smith, I. T.	Palmerston
Spiers, R. T.	West Taieri
Smallridge, J. V.	Pleasant Pt.
Simpson, R.	Marton
Sutton, W.	Marton
Shannon, P.	Marton
Smith, V.	Marton
Smith, T. L. J.	Marton
Tickener, L.	Dannevirke
Toppins, J. A.	Inglewood
Trevor, C.	Maunga-karamea
Thomson, J.	Maunga-karamea
Wall, J.	Murchison
Winfield, R.	Murchison
Whale, F. G.‡	Murchison
Westbrook, K.	Murchison

* Killed in action.

† Missing.

‡ Prisoner of War.

Name.	*Club.*
Winters, S. G.	Pukehina
Woisin, V. C.	Pukehina
Williams, R. G.	Paengaroa
Walker, E.	Dannevirke
Weston, R. W.	Mangaweka
Young, L. H.	Opiki
Young, A. F.	Opiki
Young, J.	Opiki

ROYAL AIR FORCE.

Castles, J.	Dannevirke
Castles, E.	Dannevirke

Name.	*Club.*
Carmichael, D. A.	Dannevirke
Cocker, M. F.	Dannevirke
Drummond, J.*	Dannevirke
Downie, S. T. F.	Murchison
Emmett, R.	Mauku
Emmett, W.	Marton
Kempton, H.	Marton
Marshall, G.*	Marton
Moss, L.	Marton
Peters, E. J.*	Dannevirke
Sutherland, A. J.	Pleasant Pt.

Name.	*Club.*
Shield, R.	Marton
Talbot, A. D.	Pleasant Pt.
Watson, S.	Mauku
Wing, R.	Marton

NAVY

Boynes, V.	Mauku
France, J.	Pleasant Pt.

Meeting of Dominion Executive Committee

A MEETING of the Dominion Executive Committee of the of the Young Farmers' Clubs was held in Christchurch on November 6. There was a good attendance, all four councils being represented. The following were present:—Mr. D. S. Ross (Dominion President), who presided, Messrs. W. G. Brownlie (Chairman, Wellington Council), T. E. Streeter (Acting Chairman, Canterbury Council), S. R. Whyte and Maitland Clark (Otago-Southland Council), H. G. Stephens, J. Barclay, and H. L. Chisnall (Canterbury Council), W. F. McLaren (Wellington Council), H. Woodyear-Smith (Auckland Council), A. P. O'Shea (Farmers' Union), A. C. Morton (Massey College), P. G. Stevens (Lincoln College), and S. Freeman (Organising Secretary).

The keynote of the meeting was the very apparent determination of those closely associated with the Y.F.C. organisation to use every endeavour to keep the movement on its feet. The meeting was productive of some very frank discussion, and considerable time was spent in going into ways and means by which interest could be held and stimulated. A general report presented by the Organising Secretary was of particular interest, and it was the wish of the meeting that it be published in a condensed form in these pages. A resume of the report appears below.

Leading the discussion on general policy, the chairman said that the Federation was sincere in its determination to make every possible effort to keep the organisation intact. The main responsibility rested with the District Committees. These bodies should endeavour to hold regular meetings, and should make every attempt to keep their individual clubs alive. The work carried out by the Department of Agriculture and its officers who were acting as District Y.F.C. Secretaries should not be under-estimated; many of these officers had, under present conditions, extra duties to perform, and their time and travelling, so far as Y.F.C. work was concerned, must of necessity be limited. A responsibility lay with the District Chairmen, and there were many ways in which they could materially assist.

Motions Carried

The following motions dealing with policy were carried:—

"That District Committees be asked to set definite dates for meetings for the period of one year ahead, at not greater intervals than three months, and that clubs be asked to request members to see that whatever activities are undertaken in connection with the war effort should, wherever possible, be undertaken officially by the clubs."

"That the Dominion Executive Committee reaffirms its opinion that on the District Committees rests the bulk of the responsibility of keeping the Y.F.C. movement alive in the respective districts, and again urges upon all District Committees the necessity for the holding of regular meetings; and, further, that the Dominion Executive Committee instructs the Organising Secretary to communicate direct with the officials of any District Committee which does not appear to be fulfilling its proper functions."

"That it be a recommendation to Councils and District Committees that where a prospective chairman of such a body is likely to be called on for military service during the year, provision should be made, where possible, for a capable deputy-chairman who is not likely to be called up."

"That, in order to assist the Councils in the implementation of the policy of the Federation, the District Committees, in particular, be requested to direct their efforts to the encouragement of any activities whatsoever that will stimulate interest in the movement."

"That the Councils be communicated with, asking them to convey the thanks of the Federation to the advisory members for their help in the past, and to express appreciation of their valuable work, drawing their attention to the need of the greatest possible assistance under present conditions."

"That an appeal be sent to District Chairmen earnestly soliciting their special co-operation."

"That the Federation abandon all national competitions for the duration of the war, this decision to be brought up at the next annual general meeting for confirmation."

Other Business

An invitation was received from the New Zealand Farmers' Union to nominate a representative of the Y.F.C. Dominion Executive to attend meetings of the Dominion Executive of the Farmers' Union, and Mr. J. Barclay, Canterbury, was elected. The Or-

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ganising Secretary was instructed to contact other kindred bodies in an endeavour to secure similar representation.

The question of Women's Auxiliaries was discussed, and it was decided that a small sub-committee should be set up to consider rules, etc. The committee is to consist of three members of the Wellington Council, to be elected by that body, and to bring down recommendations to the next meeting of the Dominion Executive Committee.

In regard to unpaid "Journal" subscriptions, the following resolution was carried:—"That in the case of clubs in recess whose funds are held in trust by District Committees, authority be given to District Committees to pay to the Federation, out of such funds, the amounts of any 'Journal' subscriptions unpaid by the particular clubs."

An interpretation of Clause 21 of the constitution, as applied to the war effort, was sought, and the following ruling given: "That, in the opinion of the Dominion Executive Committee, any person who is disloyal, or who is unwilling to contribute his share of the war effort or assist in the defence of the Dominion, shall be considered to be guilty of conduct unworthy of a member."

Remits

The following remits were dealt with and carried as motions:—

"That it be a recommendation to District Committees that, where possible, arrangements be made for the formation of Young Farmers' Clubs in secondary schools." (Otago-Southland Council).

"That it be a recommendation that the assistance be sought of Education Board agricultural instructors and agricultural instructors at training colleges in the recruitment of members for Young Farmers' Clubs, and that such instructors, where possible, be co-opted as members of councils." (Otago-Southland Council.)

"That some form of identification disc be provided by the Federation, to be worn by members attending the annual general meetings of the Federation." (Auckland Council.)

A vote of thanks was proposed to Professor Hudson and the staff of Lincoln College for their kindness and hospitality to North Island members of the Dominion Executive Committee on the previous day, when the members were enabled to join with members of the Canterbury Council in a tour of the college grounds, and were very hospitably entertained. Mr. P. G. Stevens thanked the meeting on behalf of the college, and referred to the building which had been erected for the accommodation of "short-course" students, expressing the hope that the Y.F.C. members would, as opportunity permitted, make full use of them.

Report of Organising Secretary

INDICATING the position of the Federation to date, the general report presented by the Organising Secretary at the recent Dominion Executive Committee Meeting stated that since the annual general meeting a little over three months ago 10 further clubs had gone into recess, while information in regard to six others showed them to be very weak and likely to have to close down. All of these were in the North Island, and none had closed down lately in the South Island. As a welcome surprise, a new club had been formed in the Te Kuiti district, due to the efforts of the Otorohanga Club adjoining. In addition, a Canterbury Club which had previously gone into recess had been revived. Since the outbreak of war the number of clubs in the various Council areas had been reduced as follows:—Otago-Southland, 7; Canterbury, 10; Wellington, 37; Auckland, 23; a total reduction of 77 in the number of clubs still active. This left 126 active clubs to date—Otago-Southland, 28; Canterbury, 28; Wellington, 40; Auckland, 30.

The importance of District Committees and the necessity for regular meetings of these bodies was stressed. Attempts, successful and otherwise, to revive some of the weaker clubs were referred to, and the need of further recruiting "drives" was indicated. The older and advisory members who had assisted in the past were being appealed to, as their assistance was needed to train new leaders from among the younger members to replace those serving with the forces. Probably close on 3000 members were engaged in serving in various capacities, which had meant a severe depletion of membership.

Through pressure of space it has been necessary to hold over the continuation of the article by the Cardiff Y.F.C. on "Farm Shelter." The final instalment will appear next month.

Despite this and other difficulties, the opinion was expressed that if every effort were put forward, the majority of the clubs at present functioning could be held. Some, at any rate, of the clubs should never have been allowed to go into recess; their members had lost heart, and had just followed the line of least resistance. This was where their District Committees had failed. It was considered that further avenues for recruiting members should be explored, and the success of three clubs formed in District High Schools was cited.

Doubtless the success in holding the organisation together would depend upon the duration of the war, and in this connection it had been suggested in some quarters that, because of increasing difficulties, the wiser course would be to close down the movement for the period of the war. This, however, would be a confession of weakness, and in addition, it would be extremely difficult to revive the movement without some definite foundation to rebuild upon. It would be better, if necessary, to "go down with colours flying." The duty to members overseas was referred to, many of them having recently expressed the hope that they would find the organisation intact when they returned.

Among the Clubs: Reports on Activities

DUNEDIN.

West Taieri.—Arrangements for stock judging competitions at Taieri Show. Social evening, the club combined with the Farmers' Union to entertain the W.D.F.U. At the previous meeting it was decided that a talk be given over 4YA by G. R. Bathgate. This meeting was a combined one with the Farmers' Union, with the idea of discussing and exchanging viewpoints on farming matters generally.

NORTH OTAGO.

Five Forks.—Address by Mr. D. Wraight on his trip through Victoria; the speaker dealt with farming conditions as compared with New Zealand.

SOUTH CANTERBURY.

Cannington.—Team selected for stock judging. Address by Rev. Malcolm Wilson, of Chalmers Church, on his travels in Scotland. The meeting was an open one, and was well attended, a number of ladies being present. At the previous meeting a talk was given by Mr. A. B. Struthers, Timaru, on "Farm Accountancy."

Geraldine.—General business and arrangements for next meeting. The club engaged in a table tennis tournament against Toc H, the latter winning by 9 games to 7.

Milford.—Medal presented by Mr. Bussel, Temuka, to be awarded to the club member gaining most points in the stock judging competition at the Timaru A. & P. Show. Mr. Bussel gave an instructive address on "The Handling of Cheques." At the previous meeting the recent Canterbury stock judging contest was discussed; the following members of the club gained awards, and also the teams aggregate:—T. Crossman 1, N. Palmer 2, and G. Crossman 4. Talk by Mr. A. Grant, Department of Agriculture, on "Farming in Germany Before the War."

Pleasant Point.—General business. Talk by Leading Stoker James France on "Islands in the Pacific." The speaker dealt with the particular islands that he had visited, and treated his audience to a very thrilling account of his experiences.

MID-CANTERBURY.

Ashburton.—Social to be held. The club meeting took the form of a farewell and presentation to Sergeant Pilot G. S. Moorhead, first chairman of the club, and the first member to join the forces. Mr. Wm. Crawford made the presentation on behalf of the club, and referred to Sergeant Pilot Moorhead's activities as a club member, wishing him a safe and speedy return. S. Watson also spoke on behalf of the club, and E. Cleland for the prefects of the school, and the School Cadets, of which Moorhead was a member.

CHRISTCHURCH.

Darfield.—General business. Final arrangements for a barn dance.

Ellesmere.—General business. Impromptu speeches by members.

NORTH CANTERBURY.

Oxford.—Lantern lecture by Mr. Beggs, Department of Agriculture, on "Subterranean Clover."

NELSON.

Murchison.—Business meeting. Arrangements for annual dance, also for a special meeting.

WAIRARAPA.

Alfredton.—Lantern lecture by Mr. N. Lamont, Department of Agriculture, on "Mole Draining." A field day was held on Mrs. K. Didsbury's estate, "Pah Flat," and consisted of mole draining demonstrations. The field day was well attended by both club members and local farmers.

Masterton.—Discussion on the club's birthday party, and also the fleece competition. Lecture by Mr. N. Lamont, Department of Agriculture, on "The Rationing of Fertilisers"; the scheme was fully dealt with and many interesting points brought out. At the previous meeting a lecture was given by Mr. M. Armstrong, Government Veterinarian, on "Diseases of the Pregnant Ewe," dealing with antepartum paralysis, milk fever, bearing troubles, etc.,

MANAWATU.

Apiti.—Discussion on the National Savings scheme. Teams selected to judge at the Feilding Y.F.C. Stock Show. Talk by Mr. S. A. McIndoe on "Seeds and Sowing."

Oroua Downs.—Teams selected to judge at Feilding Y.F.C. Stock Show; two senior and two junior teams entered. Decided to buy Christmas presents to forward to club members serving overseas.

NORTH TARANAKI.

Inglewood.—Lantern lecture by Mr. G. A. Blake, Department of Agriculture, on "Liquid Manure"; the speaker dealt with the use of liquid manure and the various types of sumps, and method of distribution.

Mangorei.—Mr. Buttermore, a member of the New Plymouth St. John Ambulance Association, gave a lecture and demonstration on the "Care of the Injured in Cases of Accident."

SOUTHERN HAWKE'S BAY.

Ballance.—Team selected to debate with the Mangatainoka Club; F. Bremner, H. Wilson,

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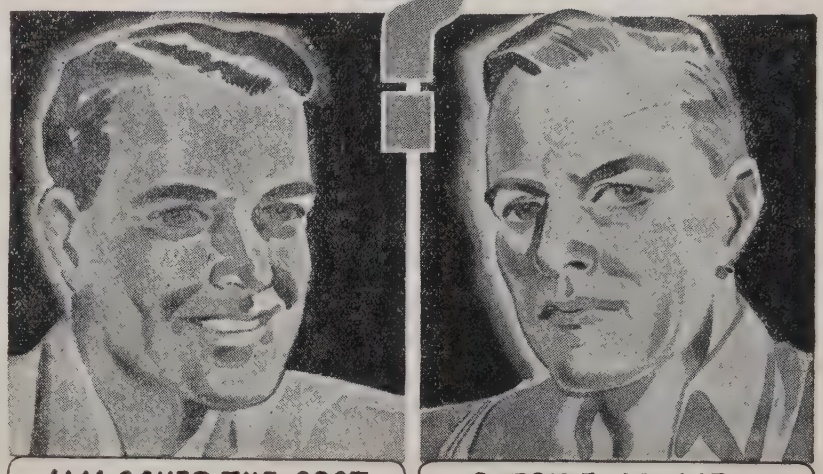

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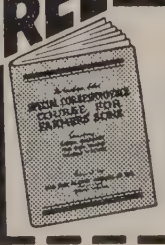

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and L. Sinclair. Address by Mr. T. Richardson on "Crops and Cropping."

NORTHERN HAWKE'S BAY.

Matapiro.—Lecture on "Vegetable Gardening," by Mr. Morecraft; the speaker detailed the growing of each of the more common vegetables in turn, and also dealt with the use of sprays, and the general treatment of the soil. Mr. D. S. Ross, Dominion Y.F.C. president, paid a visit to the club, and addressed the meeting, appealing to members to support their club so that the movement could remain intact and active in spite of a gradual decline in membership and difficult conditions generally. A hearty welcome was accorded to Mr. Ross. At the previous meeting a lecture on "Wool" was given by Mr. Pease, New Zealand Loan and Mercantile Agency Ltd. Mr. Pease dealt very fully with all phases of the woollen industry from the structure of the wool fibre to the finished product, and also touched on synthetic wool. His talk was illustrated with samples of wool and of textiles.

Meeanee.—Report of last dance, showing a profit of £3; decided to hold another dance in the near future. The lecturer for the evening being unavoidably absent, an informal talk was held.

TE KUITI.

Otorohanga.—One new member enrolled. Team selected to debate with Kakepuku Club in the semi-final of the Provincial Debating Contest. Arrangements for club birthday.

Paewhenua.—Business meeting. Debate to be held with the Otorohanga Club in the New Year. Arrangements for next meeting.

WAIKATO.

Kakepuku.—Debate with Farmers' Union, the subject being "That Women Should be Employed in Farm Work." Speakers were as follows:—Farmers' Union (negative), Messrs. W. Hodgson, A. S. Wylie, and C. Flay; Kakepuku Club (affirmative), F. Turner, A. Smart, and P. Ray. The judge, Mr. W. G. Smith, gave the award to the club team.

Te Awamutu.—Field day on Mr. H. Rhodes's property, Puterangi. Mr. Rhodes showed the party over his very modern woolshed, and gave a demonstration of docking lambs with the latest type equipment. The party then embarked in cars and trucks, and made an interesting tour of the farm, which consists of 840 acres of first-class land. The attendance numbered 38, including 20 club members, 12 schoolboys, and six farmers.

WESTERN BAY OF PLENTY.

Paengaroa.—General business. Short talks by members as follows:—K. Ball, D. Ross, G. MacFarlane, A. S. Riddell, and H. Wilkins, in a series for a trophy donated by Mr. J. B. Cawte, for the most improved speaker in the club.

Te Puke.—Two new members enrolled. Decided that the club will support the National Savings scheme to the utmost, and will endeavour to encourage others to do the same. Proposed to start a calf-rearing competition. Address by Mr. W. Flowers, Te Puke National Savings Committee, on "The Need and Value of National Savings." A very interesting letter was read from Mr. J. Nichol, past president of the club, who is now serving overseas; the letter gave some very instructive information about the value of the coconut palm.

Waihi District High School.—Lecture by Mr. A. V. Allo, Department of Agriculture, on "Ensilage." The annual social was held, and was an outstanding success.

SUBSCRIPTION RATES.

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Health Notes for the Farm

Let's Do Something About Those Flies!

"AREN'T the flies bad this summer?" Every year we hear it without fail. Last summer they were bad, the summer before they were bad, and countless summers before that they were bad.

But what are we doing about it?

The quarrel that many people have with flies is confined to their irritating habit of tickling where they alight and the need for having to snap out of a comfortable doze, perhaps, to shoo them off. This concern for personal comfort completely ignores the more serious aspect of the fly's attention—that is, the spreading of disease germs.

If, instead of complaining about the "darned little pest," these same people did something to expunge the **cause** of the complaint, they would be doing a necessary and worthwhile job. And, incidentally, they would not be bothered nearly so much.

If these people—and they are in the majority—would realise that every time a fly crawled across their foreheads, or their legs, or any other exposed part of their anatomy, it left a trail of assorted bacteria, they would probably worry about something more than the temporary personal tribulation.

Unwelcome Visitors

The fly is one of the filthiest and foulest creatures known to mankind. Every summer they come in their millions; every summer they are constant visitors at our meal tables, sipping the milk or tasting the sugar or jam. A minute later they may be tasting a dainty morsel in the garbage tin or on the rubbish tip. One second a fly may be feeding on the most indescribable filth, and the next it may be buzzing round the kitchen looking for something nice and clean and tasty to nibble.

In one unguarded moment an appetising and attractive dish may be converted into something dangerous, and even deadly—a breeding ground for the poisonous bacteria of typhoid fever, dysentery, summer sickness, even tuberculosis, and skin infections. All these diseases are spread by the fly. The bacteria adhere to the legs and bodies, and are also carried in the stomach and intestines.

Each fly, therefore, is literally loaded with poison—a winged evil which strikes swiftly and indiscriminately, a hit and run expert with terrific mobility.

Contributed by the
DEPARTMENT OF HEALTH.

A Prolific Pest

Let's get another picture of the enemy. An adult female fly will lay, as a rule, from 120 to 150 eggs at one sitting. Under favourable conditions so far as moisture and temperature are concerned, these eggs may become mature flies in about ten days, and the second generation may lay its first batch of eggs another ten days later. According to the figures arrived at by one industrious authority on the subject, a fly can produce roughly 6,000,000,000,000 descendants in a single season—assuming, of course, that all the progeny survive. This, fortunately, is not likely. But those figures will convey some idea of the appalling fecundity of the common little fly, which is born in filth, breeds in filth, and thrives on it.

The cardinal rule in the anti-fly campaign is to eliminate the breeding places. It is far better to prevent flies from breeding than to permit them to breed and then attempt to exterminate the resultant broods after they have invaded the house. You cannot, therefore, regard as efficient any system of sanitary control that harbours disease germs.

Favourite Breeding Places

The fly will breed in almost any fermenting matter, provided it is fairly moist. Stable manure is probably its favourite ground, but house refuse, garbage, rotting rags or paper, decaying vegetables and fruit all serve the same purpose.

The stable manure problem is more of a worry in the country, where special efforts should be made to make it unattractive to flies. By close packing the manure, the eggs and maggots of the fly will be killed by the heat produced in fermentation, and a solution of the following sprayed or sprinkled on the surface of the manure is invaluable:—8 oz. of arsenate of soda, half a pint of treacle, and 20 gallons of water. A mixture of ½ lb. of hellebore mixed with 10 gallons of water and left to stand for 24 hours is effective and powdered borax applied to manure at the rate of 1 lb. of borax to 16 cubic feet of manure is recommended. It may be watered afterwards. Borax may also be applied as a solution made up to 1 lb. of borax to 6 gallons of water. Be sure that the manure does not get a double dose.

Incidentally, chloride of lime has little, if any, effect in preventing the breeding of house flies.

Fly-proof Receptacles

Household refuse and all garbage must be kept in receptacles with closely-fitting lids. They should be **really** and not **nominally** fly-proof All food must be kept properly screened, and, inside the house, steps should be taken to kill as many as possible by the constant use of fly traps, fly papers, and sprays.

A useful solution is made by adding an ounce of formalin to a pint of milk and water and exposing the liquid in dishes about the room. It is essential for the success of this poison that no other liquid should attract the flies. Never let up in this conflict. If you don't get the flies, they may get you, and remember: it's not the flies you kill that matter so much as the ones which get away.

The Health Department takes a very serious view of the fly menace, and its advice is always available to those who require it.

SMALL FRUIT PLANTATIONS

(*Continued from page* 523).

when at all possible, to cut the old wood right back to the ground, leaving only the young growths from the crown. The red currant bears fruit on short spurs. Unless the bushes are very dense, it is advisable to attempt no pruning until the leaves have fallen in the late autumn.

Raspberries.—Canes which have borne fruit, and the weaker of the new canes, should be removed as soon as possible after picking to encourage the development of the new growth.

Loganberries.—After the fruit has been gathered the old vines should be cut out. The new ones should be reduced to four or six of the strongest and placed on to their wires, two or three being trained each way.

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THE Good Neighbour

BY MARY

From Me To You

AND so we come to the end of the year. Looking back, it has been a very happy year for me—I have made so many new friendships among you, and even though I haven't met my "Good Neighbours," yet I feel I know many of you as I know my oldest and dearest friends. Thank you, every one of you who has written to me during this first year of our friendship—thank you for your letters, and your thoughts.

Christmas is just around the corner now, and after Christmas, the gift of a New Year awaits us. What hopes this New Year will usher in—I pray that our hopes will be realised, and that before the bells welcome in the New Year of 1943, the joybells will have pealed out their song of peace on earth.

"Peace on earth." Today it may seem impossible—we wonder what tomorrow will bring. But nothing is impossible—peace on earth is as possible today as it was so many years ago, when the Babe was born in the manger of Bethlehem. And every Christmas is a challenge to the peoples of the world, challenging them to listen anew to the glory of that everlasting message of peace and hope that Christmas brings.

This is the time of the year to indulge in a mental spring cleaning. The corners of our mind are apt to get a little dusty towards the end of the year—sit back from yourself for a while, and make a critical survey of your good points, and your bad ones, just as other people see you. Then, when you are facing up to your New Year resolutions, remember to cast out of your mind those thoughts which are unworthy of your highest aspirations.

Listen to the message of the bells, as Tennyson heard it:

"Ring out, wild bells, to the wild sky,
The flying colour, the frosty light,
The year is dying in the night,
Ring out, wild bells, and let him die.
Ring in the valiant man, and free,
The larger heart, the kindlier hand,
Ring out the darkness of the land,
Ring in the Christ that is to be."

I do hope your Christmas will be a happy one. Our thoughts will be far away in many cases, sharing the day with those we love who are serving in distant lands, but it is Christmas for them too, and their very dearness brings them close to us.

And so I send you the old, old wish, which is still evergreen:

"A merry Christmas, and a happy New Year."

Mary

Mary's "At Home"

IT'S a topsy-turvey world we live in, and upon reading the article in the October issue, I begin to wonder if some of us will ever be right side up again. I know a new hat, a new hair-do, a change of powder and face cream will work wonders for a short time, then the strain of living is upon us again. Fight as some of us may, things just go wrong—the more we try to do right we find ourselves wrong again, trying to help others who will not help themselves, only to have our help thrown back at us. Leisure periods are hard to get these days, with so much to do on the farm, the men get none, and so feel the strain as much as we do. I see my neighbours, good, cheery, hard-working souls they were, getting more and more dour, struggling to make ends meet, rear their families, and working now much longer hours than ever before. Their world is surely topsy-turvey, and when the time comes for them to straighten up the right way again I feel they will have lost all interest and ambition. It takes a big soul to rise up in cheerfulness after years of strain and worry, and the art of rest, leisure, and playing, once lost, is hard to recapture.—**Willow, Henderson.**

I HAVE been so interested in the remarks on life, and how it may or may not be mapped out for us. Like Kaleidoscope, I maintain man is a choosing animal, for how often do we make or mar our opportunities. So much depends on how we look at things, and if a man saddles himself with a bigger hurdle than he can cope with life will be one long grind. I often think that the things we say or do come home to roost. I recall to mind one of my sisters who called our

mother all sorts of foolish names for deigning to milk a few cows to help out at odd times, and how my sister said she would never milk for anyone. She didn't then, but has never been out of the cowyard since she married. Yes, Mary, I think we work out our own salvation, as I keep reminding myself if I feel a little blue, for it is so true that where there is a will there is a way.—**Roundabout, King Country.**

LIFUKA says that her secret desire is for garden tools, a shed, and a padlock to keep them secure. According to my experience, she needs a hard heart to refuse to lend her tools, or she will soon have her shed empty. I have bought myself a number of tools at various times, but when I want to use them they are not to be found. One person after another borrows them, and either forgets or hasn't time to return them. Therefore my advice to you, Lifuka, is "Don't hesitate to say no."—**Mary Ann, Bell Block.**

MY name, Dagmar, is a Danish name, as I am of Danish origin, and seeing that it has been a family name down in a direct line since the year 1400, I am proud to bear it. Although it may seem a mouthful, its abbreviation "Mara" is very much like your name, Mary, only without the everlasting "e" sound that the English folks seem to love, such as Annie, Katie, Susie, and so on. Did it never seem funny to you? But I love the name "Mary" in spite of its "e" sound—it is a world-wide, almost international name.

I was pleased to see that Kaleidoscope and Bart replied to Biddi-Jan. I, too, think that man is a choosing animal, and that as we sow here on earth, so shall we reap, otherwise to what purpose is all the striving and toiling? We could just sit still and await our fate, and of what use would prayer be, or faith? What a comfort is that minute of silent prayer each night to those who have beloved sons overseas. —**Dagmar, Outram.**

OF late the world has been spinning round at such a speed that I've tried in vain to keep up with it, and find at times it leaves me dizzily giddy. Yes, Mary, I'm a Waaf at last, and don't I love it too! I made up my mind to like it at all costs, but never expected it to be half as interesting or thrilling. I did not get my desired transport job, but was put to work on aeroplanes, then made the discovery that planes are much more interesting than cars. So now I am a grease monkey—my hands horrified my little mother when I first went home after four weeks at work, for they are so ugly, nails broken with so much kerosene and petrol, and rough with continual scrubbing, but she has become reconciled to my war effort, for I assure her that lady's hands won't bring my big brother back home.

During my first month here they discovered, quite accidentally, that I am handy with a paint brush, with the result that I get many little odd jobs of painting, signwriting, etc., which I love doing. We get quite a lot of drill—the life is great, and keeps one very fit. I go home frequently, usually about once a fortnight—it is wonderfully quiet after all the noise and bustle of the aerodrome and the city. I always come back to the city feeling like a garden after rain.—**John-in-the-Middle.**

A NUMBER of people seem to think that the coming of the land girl is quite new for New Zealand. Not at all! During the last war I was one, although we had no such nice-sounding name as the above—we had names like "Makeshift Sal" or the "Poor substitute." A large number of willing girls did a good job of work, though, in spite of no previous training, and soon they were very efficient after a short time at their new and often very hard positions. I myself had been on a farm all my life, but I found plenty to do when I took a position on a farm as part help for the lady in the house and the farmer with all the milking and outside duties. Rising at 4.30 each morning, after making a cup of tea I would set out to assist the farmer in milking 50 cows, then feed 40 calves and a number of pigs. The wife prepared the breakfast, after which I would help in the house if there was no urgent outside work. I received the wage of 30s. a week for the position, which was considered quite a good wage in those times.—**"Old Timer," New Plymouth.**

If I had two loaves of bread, I would sell one and buy hyacinths, for they would feed my soul.

IF you have some small boys anxious to make Christmas presents for friends who are garden-lovers, here is an idea. Let them cut some manuka about ¾-inch in diameter into 9-inch lengths. One end is sharpened to a point, and at the other a flat piece is cut out, painted white, and either left blank or named in black paint. The pointed ends are dipped into used car oil to preserve them. A set of these garden sticks makes an unusual and welcome present.—**Kingfisher, Owaka.**

CONGRATULATIONS on the gardening section! Oh, if we could only live up to all we know, and do everything at the correct time! I'm afraid only the weeds keep up to schedule in my garden. Anyway, the weather is against the gardener these days. I wish you could see our hedge at present. Hawthorn—green branches and heavy sprays of white blossom—and, growing wild, wending their way through the greenery, are big, soft pink roses. Birds dart from branch to branch, putting the finishing touch to a beautiful picture.—**M., Feilding.**

Once Again . . .

ALL over the world now people are preparing once again for Christmas, as people have done for years and years down the long centuries. Records show that as long ago as A.D. 129 the Bishop of Rome was interested in the custom of carol-singing at Christmas—think of that when you raise your voice in song and praise at church on Christmas morning. You are keeping alive one of the most beautiful customs of Christmas by singing carols.

The festive season is alive with legends and superstition—I think the holly takes first place in legend. Here is a delightful story about the holly which will make an admirable Christmas Eve bedtime story for the little ones.

There was an ancient prophecy in Palestine that the first tree to recognise the Saviour would be made the most beautiful tree in the world. So all the trees that grew in Palestine kept watching for the kingly boy to come, but only one tree noticed a little boy who wandered frequently in the quiet countryside, and that tree was

A Rosary of Friends.

Always when the old year ends,
I clasp my rosary of friends,
And pause to breathe a thankful prayer
For every bead of friendship there.
And always first I count the old,
Each one a bead of shining gold,
Worn smooth by constant burnishing
Of joy that old-time friendships bring.
And there are others shyly new,
Out of the shadows farthest blue.
Like homing birds whose hearts have flown
To find dear lodgment in my own.
Friendships are life's best gift to me—
Oh, may I guard them tenderly—
And closer hold each heart God sends
To bless my rosary of friends!

—Marie Barton.

the prickly holly. It noticed that the shy birds and animals made such a friend of this little boy who was kind to them that the holly resolved, too, to be kind to the birds and small creatures.

He thought he would please the boy by so doing, and dropped all his leaves with the prickles uppermost. After that the rabbits and other timid animals came to the holly and made homes for their small ones at its feet, beneath its sheltering leaves. In its branches the birds made their nests, and the holly was beloved of birds and animals.

Twenty-five years later, when a cross was raised in Palestine, the holly was made beautiful with blood-red berries. And so it is that the holly is today one of our most favoured Christmas emblems.

It's a "Merry Christmas" wish from Shirley Temple, who takes time off from her role in Metro-Goldwyn-Mayer studios to prepare for the Yuletide season.

In the county of Rutland, in England, it is supposed to be unlucky to bring holly into the house before Christmas Eve, and in Worcestershire and Herefordshire the folk eagerly seek holly which has adorned a church, believing it to be lucky.

The Slavonic churches have an unusual custom which is observed on Christmas morning: the congregation kiss, and say "Christ is born," and the answer is, "Of a truth, He is born."

But I think what I like most about Christmas is the link it provides with friends, the world over. The American writer Lloyd C. Douglas expresses my sentiments in the following quotation:

". . . It occurs to me that the world couldn't possibly survive without Christmas. I doubt whether our civilisation could endure if it weren't for the general armistice observed on Christmas. For at least a whole month every year, all civilisation has its attention captured by the coming of Christmas. Rumours of international jangles are pushed off the front page to make way for local stories of philanthropies. The poor have their inning. The rich abandon their arrogance. It takes just that much easement of the strain of greed and animosity to keep the old ship seaworthy.

"And all the presents, and Christmas cards, they help, too. Millions of people examine the lists of their old friends, and remember them, and prepare affectionate greetings for them. I dare say the bulk of these valuable friendships would be utterly lost if

Merry Christmas

Christmas were omitted for a few years.

"For about a month most people are thinking more of their friends than themselves. It takes their minds off their own troubles; makes them—at least temporarily—a little better than they are. It steadies them. We've thought about Christmas as a day—the twenty-fifth day of December. The fact is Christmas is at least one-twelfth of the calendar year. We'd better hang on to it, if we know what's good for us."

Yes, we'll hang on to it all right. Christmas this year will not be the same as Christmas was last year, and the Christmas of last year was very different from the Christmas of the year before. But the years go on, and Christmas is still the most-loved festival of festivals—do you think there is any chance of it dying out? Never, never, never!

Life is made up of little things. It is but once in an age that occasion is offered for doing a great deed. True greatness consists in being great in little things.

—George Macdonald.

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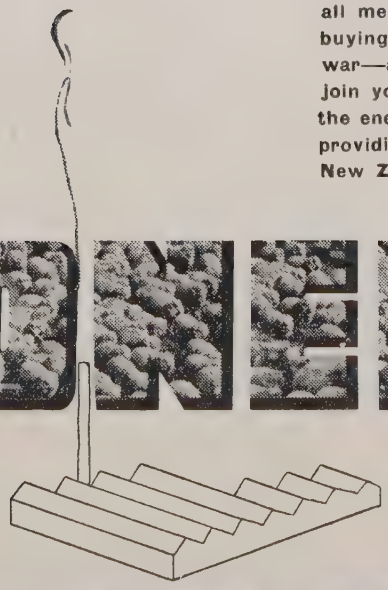

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Christmas in New Zealand

I SHALL never forget my first Christmas in New Zealand—it was so difficult, everything so strange: Christmas in midsummer, and for New Year an invitation to a bathing picnic!

No, I could not muster the Christmas feeling, I could not find a single idea for the right Christmas gifts. I had only my husband to prepare presents for that Christmas. He needed pyjamas, and working socks, and, of course, he was going to get them from me. But there's nothing festive about pyjamas and socks, is there? Besides, my mother had made it an iron rule at home that Christmas gifts must be hand-made. So I set to work and re-covered a treasured copy of one of my husband's favourite books for him: coarse grey linen did the trick, with the name of the book embroidered on it. The greatest surprise my husband was to have at Christmas gave me, however, some dull work: I darned all his socks, sewed on all the buttons missing on his garments, and did some necessary patching.

Decorating the Christmas table was the most important thing. I wouldn't have a Christmas tree, because I didn't consider a baby pine tree fit for the occasion, but I made a round Christmas crown of evergreens and red berries, bound it with silver ribbon, and put twenty-four white and very tiny candles in it. I put this in the middle of my white linen tablecloth, squared with silver ribbon, and set with small red tomatoes, and more candles. To bring a note of New Zealand summer into all this green-silver-and-whiteness I fetched a little family of English pottery ducks, but ducks like a pool to swim in, so I found my husband's shaving mirror, which fortunately fitted just inside the Christmas crown, and set the ducks a-swimming in the middle of it!

The presents I arranged all round the table, and decorated everything with green sprigs and silver threads. My husband was very happy because we had a goose instead of the orthodox English turkey. And there was

Holiday fun! Ann Rutherford, Metro-Goldwyn-Mayer starlet, typifies how many of us will spend Christmas in New Zealand.

the real Christmas spirit in our house after all, New Zealand summer or no, and although it was all so new to me, and so strange, the memory of that day is still very precious.

—Heidi, Kati Kati.

While the Log Burns . . .

A Mary Webb Anthology.

HOW many of you have read and loved those books from the pen of this woman writer that will live with us forever?

"Precious Bane" and "The Golden Arrow" are my own particular favourites. She has written others, too—and it has been a joy to find the cream of her work gathered within two covers. H. B. L. Webb, who has edited this anthology of Mary Webb, certainly set himself a hard task, for it is no easy matter to discriminate when there is such a wealth of material to draw upon as in the writings of Mary Webb.

I think her books will appeal to you, because she was essentially a country woman, and although her books are laid in Shropshire yet her eyes which saw Nature are your eyes which will see Nature in the same way over here in our own country, and you will indeed appreciate the greatness of her writing if you are familiar with the countryside in the same way as she knew it. In this anthology are gathered together bits from her books, little unpublished fragments, and verse—it is all a delight. The book, too, is generously illustrated with black and white sketches, and four colour plates.

I would like to share every bit of this book with you, but I have chosen for your delight one small piece from her book "The Spring of Joy." Mary Webb has called it "Opportunity," and it gives us, in a few lines, a deep insight into the heart and feelings of this outstanding writer.

"It does not matter how shut in we are. Opportunity for wide experience is of small account in this as in other things; it is depth that brings understanding and life. Dawn, seen through a sick woman's window, however narrow, pulses with the same fresh wonder as it does over the whole width of the sea. A branch of flushed wild-apple brings the same joy as the mauve trumpet-flower of the tropics. One violet is as sweet as an acre of them. And it often happens—as if by a kindly law of compensation—that those who have only one violet find the way through its narrow, purple gate into the land of God, while so many who walk over dewy carpets of them do not so much as know that there is a land or a way."

1942.

What do I ask of '42?
A friend to love, whate'er I do,
A road to travel, a horse to ride,
A heart to laugh, whate'er betide.
A dream to dream, a song to sing,
Courage to meet what fate may bring.
A battle to fight, a game to play.
Sleep at the end of the longest day.
And oh, through good report and ill,
My dog, my dog, to love me still.

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Our Competition

NEW YEAR RESOLUTIONS

HAVE you made your New Year resolutions yet? Perhaps yes, perhaps no, but I do feel that all my "Good Neighbours" will be inspired by the New Year resolutions of some of us, and here they are for you to read. Life promises to be fuller and happier in the coming year if we all unite in the common cause of making the world a better place in which to live. Congratulations, "Good Neighbours," on your high ideals, and may you be given strength and courage enough to live up to them in this and future years.

First prize to "Mini Haha," Otago, second to "Molly Malone," Otago, while highly commended we have "Willow," Henderson, and "Jonathan," Blenheim.

First Prize

FIRSTLY, I have resolved to waste less time in trivial things, to cut out unnecessary cleaning, elaborate, unwholesome cooking, and credit my friends with wishing to visit me, more for the interchange of ideas and companionship than for elaborate nourishment. I must make and take time for the true essentials of life—use the creative talent, however feeble, which is in me. Write more, learn more, think more, read more extensively and wisely. Take a wider and more intelligent interest in current events, and, above all, give my support and encouragement to all genuine attempts at a lasting peace. Pray, work, and think that war and the desire for war will be wiped off the earth, and that those babes we cherish in their cradles, and the children yet unborn will never know the horrors and heartaches that our generation has been called upon to face.—**"Mini Haha," Otago.**

Cool and smart for an afternoon in the sun, Martha O'Driscoll, Columbia star, displays to advantage white shantung shorts, with unpressed front pleats, belted, with coral and white striped blouse which matches the shorts.

Second Prize

AS New Year resolutions are definitely individual things, my efforts will have an egotistical twist that cannot be avoided.

(1) I am going to be more of a "family" woman in 1942. I am going to play with my children, and laugh with my husband, for a man never leaves a laughing wife. (Not that he's shown any inclination to do so yet, but you never know. . . .)

(2) I am going to stop polishing up my house, and take a bit of time off each day to polish up my mind. It needs it.

(3) I am going to develop that lost art. What is the use of being a fair performer on the piano in my 'teens if I lose it in my forties?

(4) I am going to make at least five new friends, and keep them. Not that I've lost any of the old ones, but we get in a bit of a rut after 40, and new friends get one out of it, I think.

(5) I am going to write a novel in 1942, and get it published somehow, somewhere.

(6) It's no good saying I'll be kinder, more unselfish, more tolerant, for I "resolved" those in 1941, and didn't keep them. So for 1942 I'll be quiet and confident, for "in quietness and confidence shall be your strength."—**Molly Malone, Otago.**

Highly Commended

I MAKE them before each New Year, some I have managed to keep, but some, I am afraid, have been forgotten. Here are some for 1942.

Never to speak one word or commit one deed which may help to endanger our men or our country.

To keep cheerful no matter what happens.

To try to be more economical so that more food can be sent to Britain.

Stop to think before I speak, as there is so much hidden mystery just now that a careless word may only make it deeper.

And I must try to rust the hate I have for some people.—**Willow, Henderson.**

I MAKE them, but not on January 1st. Mine are registered on my own personal New Year, the eve of my birthday, because for me that is the time for spiritual stocktaking. And because I believe in using a resolution as a challenge to create better habits, and not merely to forsake bad ones, I put my faith in two.

The first: "I resolve to have about me only those things which I believe to be beautiful, or know to be useful." (William Morris.) It is an ideal worthy of one's striving.

The other: "To finish those things I have begun, and to do those I have planned." This, too, provides a challenge, for I am apt to begin one subject before finishing another.

And from now on, I mean to add this quaint couplet to the other two:

"I'll clear the corners of my heart,
And sweep out all debris,
Because this time I wish the year,
A bright and happy me."

(N. G. Bordeaux.)

—**London Lass, Wellington.**

NEW YEAR resolutions seem to bring the year's end very much nearer. I think this year I'll endeavour to make resolutions that I can keep. First to remember my prayers, and to pray daily for peace with honour. Secondly, to try each day to do something in the nature of war work. This will depend on the time, and opportunity, but with the will to do it, each one of us

The Ideal Husband

NOT long ago you aired your views on "The Perfect Wife." Now, what about your ideas on "The Ideal Husband"? I won't say "perfect," for husbands never are, but lots of husbands are ideal—or very nearly so! Let's have your ideas.

"THE IDEAL HUSBAND."

10/- for the best entry received by January 20th, 1942, and 5/- for second.

"MARY,"
C/o "Journal of Agriculture,"
P.O. Box 3004, Wellington.

¶Closing date: 20th January, 1942.

can do something each day to help along the cause we have at heart. And my third resolution will be to increase my National Savings account as much as I am able. I've tried to do so this year, but will endeavour to do more next year.—**Laurel, Feilding.**

ONE of my New Year resolutions will be to stop using such slang as "gosh" and "gee." I try to remind myself of the little boy who always said "Okay" and was finally changed into a parrot, but I imagine myself up on a perch in a cage, and knowing that I would fit in nothing smaller than a lion's cage, I am afraid.—**Jane, Waverley.**

I AM making only two this year. The first is to follow the heading on our pages, and be a good neighbour.

International Wool Secretariat Fashion.
Navy blue wool redingote with seamed back and unpressed pleats below the waistline . . . red and gold leather button trimming . . . navy blue sailor beret with scarlet pompom.

Homesteads in this part are so few and far between that we are very inclined to live the days to ourselves, and not to bother about neighbours. But it has come home to me so forcibly that true neighbourliness is one of the greatest needs of the world today, that it will be my earnest endeavour to bring this spirit of greater friendliness into my part of the country.

My second resolution is to refurbish my sense of humour, which has become a little rusty in the hard sad years that have passed. Instead of bearing up to my troubles, I have got down to them. This passage by Sheila Macdonald always brings me back to regarding a sense of humour as my most precious possession. Janet says: "Do you know what I'd teach my children, first, last, and foremost? I'd teach them to laugh at life, to see a joke in everything—a smashed toy, a scraped knee, everything. Then later on in life, when the smashed toy perhaps becomes a smashed life, they'd still have laughter to sweeten their going. A sense of humour is more precious a possession than virtue. You can never really touch rock bottom if you have it."—**Waimai, Tuakau.**

BEING born into a large family with none too much money to spread over multitudinous calls, I acquired a habit of "making do." This is lamentable in that it often does away with initiative and instils a carefree method that frequently leads to disregard in obtaining the best results. So having realised this, I intend to put both my feet forward to creating a better purpose in all things; in short to make results the goal and reward.—**Mrs. Vee, Waikato.**

WE who have the grim horror of our men's future so near to being violated, and those who have already been bereaved, can make but one New Year resolution, and in that resolution let us unite wholeheartedly. But it is not a new resolution—just a renewal of last year's: "Let us all be brave."—**That's Me, Ohakune.**

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. . . How Does Your Garden Grow?

HELLO, Garden Lovers. Going away for Christmas? I know it's hard to go away, even for a few days, especially now that the weather is dry, and you like to give your pet plants a daily drink. We'll hope for a few light summer showers while you are away to ease your peace of mind, and in this month's article Mr. Hyde tells you what to do when you come back.

FORTUNATELY, during the summer holiday period the flower garden does not demand the attention required at other seasons. On return from the holidays the removal of spent blooms, a little summer pruning to curb the energies of plants inclined to ramp, shallow cultivation to increase the availability of plant foods and check their being robbed by weed plants will be among the more urgent attentions required to give the garden that appearance of health and brightness which is attractive.

To a few fashionable favourites, such as dahlias, chrysanthemums, roses, etc., a little extra attention is usually extended, which meets with a generous response. In general, it consists of restraining and regulating growth, and feeding the plants at intervals. By "stopping"—that is, by pinching back the leading shoot of dahlias and chrysanthemums after a few inches of growth have been made—branching is induced, and when about six leading branches are established no more are allowed to grow. On these main branches lateral growth is suppressed by pinching it out while tender and before it has become established. One or two laterals at the base of each branch are sometimes allowed to develop and produce a second crop of bloom after that on the main leaders is finished. This training, which results in a greatly improved crop of flowers, should be given regular attention now during the weekly "day-in-the-garden." Staking and tying will also require attention where the tall varieties are grown.

How does your garden grow? Martha Scott, of Columbia studios, sets off for her garden in a cotton garden outfit in blue and gold. The large sun hat is faced in blue to match the top of the dress, while the full skirt is trimmed with pockets designed to hold garden tools.

What To Do During January.

Give a little extra attention to such plants as dahlias, chrysanthemums, roses, etc. It consists mainly in regulating growth, and extra feeding at intervals or applying a rich mulch.

Give light cultivation once a fortnight, and apply water as required.

Take cuttings of alpines, pinks, lavender, geraniums, hydrangeas, etc. Also layer border carnations.

Sow seeds of Iceland poppies, pansies, violas, also East Lothian and Brompton stocks.

The roses get their training somewhat along these lines when they are pruned during the spring. Summer pruning of roses now consists chiefly in pruning to a leaf pointing outwards on the new wood from which the spring bloom has been cut. with a view to getting more new growth and autumn blossom. New growth from the crown of the root is best left uncut unless it is inclined to bolt and become coarse, in which case it should be stopped by cutting away a few inches of the top or removed altogether.

Feeding these favourites has to be done after consideration of the soil condition, the weather experienced, and the age and condition of the plants. Manurial treatment during winter and spring should assure good initial growth. When the flower buds appear liquid manure is sometimes applied weekly until the flowering period is over, except in the case of chrysanthemums, where it is best discontinued when the flower buds begin to break. Busy people, however, especially when gardening on light land, will probably find it best to apply a top dressing at this stage. In the absence of fertilisers it may consist of wood ashes, bone dust, and decayed sheep or cow manure, about ¼ lb. of each to the square yard, or rather more of the manure ingredient. Watering and cultivation must also be attended to; it is by that means chiefly that plant foods applied are made available.

Many plants are now increased by cuttings, and some old favourites are raised from seed. The half-ripened growths of alpines, hydrangeas, and geraniums, and side shoots of pinks, lavender, etc., may be rooted now in sand or sandy loam about 4 inches deep on a layer of sphagnum moss in a well-drained, shady position, covered with a frame and glass sash to check evaporation. Until they are rooted they must be sprayed frequently to prevent flagging, and afterwards gradually hardened by exposure to light and air.

Seasonable sowings now are Iceland poppies, pansies and violas, and also East Lothian and Brompton stocks. Satisfaction with these crops is best obtained from seeds of high strain. Border carnations are increased by layering now.

—WM. C. HYDE. Horticulturist, Wellington.

Perfect Guests.

LAST week we had some friends who stayed with us for the night. It is the first time they have ever stayed the night, and they were truly the perfect guests. They did not sit and talk until the early hours of the morning, as they knew we had to be up to milk, and when I came up from the shed to get breakfast the lady of the party was just hanging their sheets, pillowcases, and towels on the line, all nicely washed!—**Plain Jane, Taupiri.**

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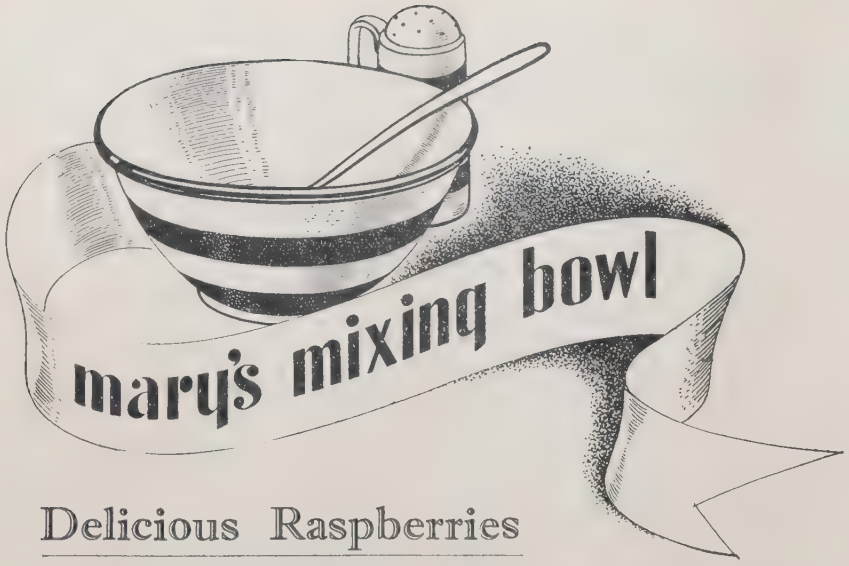


Delicious Raspberries

THE prize of 2s. 6d. for the best way of serving raspberries is awarded to "Roundabout," Waimiha, for the following entry:—

RASPBERRY MERINGUE CAKE.

2 cups sifted flour, ½ cup or ¼ lb. butter, 4 egg yolks, beaten, 4 egg whites stiffly beaten, 4 teasp. baking powder (level), 1 cup sugar, ¾ cup milk, 1 teasp. vanilla, ½ cup sugar, fresh raspberries.

Sift flour once, add baking powder, and sift again. Cream butter, add sugar gradually, till light and fluffy. Add egg yolks, then sifted flour, alternately with milk. Beat well until smooth. Add vanilla. Bake in two 9-inch sandwich tins about 25 minutes. Then cool. Fold ½ cup sugar slowly into beaten egg whites. Pile meringue lightly on the two cakes and return to moderate oven to brown (about 15 minutes). Prepare the berries, reserving the best for garnishing. Crush the remainder with a little sugar. Spread between layers. Garnish top. Strawberries or blackberries are also delicious served this way.—**Roundabout, Waimiha.**

RASPBERRY PUFFS.

1 cup flour, 1 teaspoon baking powder, milk to mix, stewed raspberry (drained).

Mix dry ingredients with milk to a thick batter. Butter cups well, pour a tablespoonful batter into each, then some raspberries, cover with batter. Cover cups with buttered paper and steam 20 minutes. Serve with cream or a cornflour sauce made with the juice drained from the raspberries.—**M., Feilding.**

BOTTLING RASPBERRIES.

Pick raspberries into jars (send your jars to the garden if you can't pick them yourselves). Choose raspberries not too ripe. Make a syrup with one cup sugar, 1 cup water, and boil for ten minutes (sufficient quantity for 1 quart jar). Warm jars of raspberries in the oven for about two minutes, fill up with the boiling syrup, and screw down. When opened they are ready to serve. The hot syrup cooks them perfectly.—**Lifuka, Motueka.**

FRUIT BLEND.

Stir five tablespoons honey into two cups of cold water. Add the juice of 2 oranges, 1 lemon, and one half of a grapefruit. Stir in one cup of stewed and mashed raspberries. Chill and serve in beverage glasses.—**Gina, Maraekakaho.**

3 eggs, 4 oz. sugar, 4 oz. flour, ½ teasp. cream of tartar, ¼ teasp. carb. soda, 1 teasp. butter, 3 tablespoons water.

Separate whites and yolks of eggs; beat whites stiffy, then add yolks, then the sugar and beat until mixture is stiff and thick. Stir in lightly well sifted flour and cream of tartar. Boil butter and water and pour into soda. Mix well, then add to cake and stir lightly. Pour into square or oblong cake tin and bake in quick oven. When cool split in two with a sharp knife. Spread one side with one cup of fresh raspberries which have been mashed with half cup of icing sugar. Put together as a sandwich. Decorate top with a band of roses of whipped cream and fill in centre with fresh raspberries sprinkled with icing sugar and roses of cream.—**Gina, Maraekakaho.**

RASPBERRY CREAM.

1 pint of raspberries, ¼ lb. sugar, ¾ oz. gelatine, ½ pt. cream, juice of a lemon.

Pick over the fruit and add half the sugar and put into the oven to allow it to warm but not to cook. This is to extract the utmost juice. Then rub through a fine sieve. Dissolve the gelatine in 3 tablespoons of warm water and when dissolved add the stewed fruit. Then stir in the remainder of the sugar and the lemon juice. Lastly, whip up the cream fairly stiffly and stir into the other ingredients. Blend all with a whisk and pour into a wetted mould. Put aside to set in a cool place (or the refrigerator if you have one). Turn out and serve with a chopped raspberry jelly round the dish.—**N.M., Whangarei.**

RASPBERRY DELIGHTS.

Make a good puff pastry, line paper cake containers with the same, then place custard mixture in each; bake in a quick oven; when cool place raspberries on and top with whipped cream, flavoured with a little juice from the raspberries. May be made in large containers and served as a dessert.—**Mrs. M. Hodgkinson, Hastings.**

RASPBERRY MERINGUE.

Beat well the whites of two eggs, then very carefuly fold in 4 tablespoons sugar; do not beat again, but see that sugar is well mixed with egg whites. Grease a sheet of paper to cover the oven shelf and turn meringue out on to the paper, shaping round and rather flat. As this quantity makes a big meringue I sometimes make two. Oven to 250 deg., then turn off, put meringue in and leave over night. Next day, turn on to dish with flat side up and carefully scrape out some of the centre. Fill with whipped cream and plenty of raspberries. To be extra nice should be filled about 1½ hours before the meal.—**Willow, Henderson.**

RASPBERRY JAM.

Allow 1 lb. of sugar to every lb. of fruit, simmer the fruit by itself for about 20 minutes until quite soft, stir well. Add sugar and simmer for another 20 minutes. This is superior in colour and flavour to that which is made by adding the sugar at first.—**Maisie, Timaru.**

RASPBERRY VINEGAR.

2 lb. raspberries, 1 pt. table vinegar, 1 lb. sugar, to each pt. juice.

Put fruit into vinegar and leave for 24 hours. Press out juice, strain, add sugar, and boil to a syrup.—**Kingfisher, S. Otago.**

RASPBERRY DELIGHT.

Moisten 2 tablespoons of gelatine in ½ cup cold water, add 1 cup boiling water, and stir till dissolved. Add ½ cup orange juice, 2 tablespoons of lemon juice, 1 cup sugar, add 3 cups of mashed raspberries. When cool, beat till light and then add 2 stiffly-beaten egg whites. Pour into mould

and set in cool place. Garnish with whipped cream and whole raspberries. —**"B. Wise," New Plymouth.**

RASPBERRY PIE.

Line a shallow dish or deep plate with a good short pie crust and fill with berries. Add a cup of sugar mixed with 1 tablespoon flour. Cover with a fairly thick paste making several incisions for escaping steam. Bake until a nice brown and serve when cool.—**"B. Wise," New Plymouth.**

STEAMED RASPBERRY PUDDING.

2 cups of flour, ½ cup chopped suet, 1 teaspoon baking powder, ½ cup sugar, 3 cups of raspberries, good pinch salt.

Mix altogether with cold water to a medium consistency and steam in basin for two hours.—**"B. Wise," New Plymouth.**

RASPBERRY SHORTCAKE.

4 oz. butter, 3 oz. sugar, 1 egg, 8 oz. flour, teaspoon baking powder.

Cream butter and sugar, add egg unbeaten, and beat well; add flour and baking powder sieved together. Roll out ¼-inch thick and bake on a pyrex plate or other flat dish about 20 minutes in a good oven. Mash some raspberries, sprinkle with sugar, and spread on shortcake just before serving. Put some whole raspberries on top and decorate with spoons of whipped cream.—**Waimai, Tuakau.**

PASSION FRUIT LAYER CAKE.

2 oz. butter, 4 oz. castor sugar, 1 tablespoon passion fruit pulp, 2 eggs, 3 oz. flour, 1 oz. Edmonds custard powder, 1 teaspoon Edmonds baking powder, 1 tablespoon warm water.

Cream butter and sugar, add passion fruit, then beaten eggs alternately with sifted dry ingredients. Lastly add warm water. Bake in greased sandwich tins for 20 minutes in fairly hot oven (375° F.). When cold put together with passion fruit filling. Cornflour may be used instead of custard powder.

Savouries

SERVE them for afternoon tea or supper—they are always welcome, and always disappear.

Let us share your recipes for savouries. 2/6 for the best one sent to the "Mixing Bowl" by January 20th, 1942.

HASTY PUDDING.

One quart milk, 3 tablespoons cornflour, 1 level teaspoon salt, 1 tablespoon butter, and little sugar.

Mix the flour with little cold milk to a smooth paste. Put the salt with the rest of milk, and bring to boiling point. Pour over cornflour, return to fire, and boil 15 minutes. Then add butter. Stand in a pan of hot water, and keep quite hot until ready to serve. Send to the table in a deep dish, and serve with sugar or jam.

CARAMEL JUNKET.

Put a third of a cup of sugar into a saucepan with a similar quantity of boiling water, and cook till the syrup is reduced to a third of a cup. When cool, slowly add a pint of lukewarm, new milk. Put into the serving dish, and stir in rather more than a teaspoonful of rennet with a few grains of salt, and a teaspoonful of vanilla essence. Leave till firm, and serve covered with whipped cream, and sprinkled with chopped nuts.

CHEESE AND CELERY SQUARES.

Five ounces flour, 2½ oz. butter, 1 oz. grated cheese, pepper and salt to taste, yolk of egg mixed with a little water.

Rub the butter into the flour, add other ingredients. Mix to a stiff paste with yolk of egg and water. Roll out and cut into small squares. Place a small quantity of prepared celery on each square. Cover with another square of paste. Pinch edges together, glaze, and bake about 20 minutes.

POTTED PASTE.

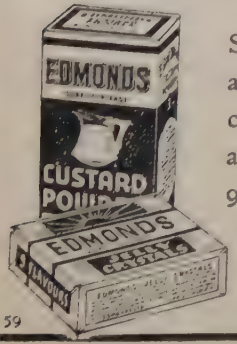
Two pounds beefsteak, 4 red herrings, ½ lb. butter, ½ pot anchovy paste.

Cook the steak until tender; bone and skin herrings, and put all through the mincer. Add paste, warm the butter, and beat all together.

Delicious!

EDMONDS

'SURE-TO-SET' JELLIES and 'SURE-TO-PLEASE' CUSTARD



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Volume 63.

July—December, 1941.

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